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INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of Practical Therapeutics

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MEDICINE AND THE MEDICAL AGE

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ORIGINAL COMMUNICATIONS.

ON THE MENTAL AND NERVOUS DISORDERS OCCURRING AS SEQUELAE OF THE RECENT EPIDEMIC OF INFLUENZA.

BY FRANCIS X. DERCUM, M.D.,

Professor of Nervous Diseases in the Jefferson Medical College of Philadelphia.

The number of cases in which mental or nervous affections occurred following the recent epidemic of influenza was in the writer's experience distinctly small, especially when compared with the number following previous epidemics or occurring as sequelæ in sporadic cases. As regards the mental disturbances, not only was the number very limited, but they were commonly very mild in character and short in duration. In but one instance were the symptoms of the cases coming under the writer's observation of such a nature as to demand institution care. The symptoms were always those of a mental confusion occurring during the postfebrile period. Usually this confusion was very mild, unattended by marked hallucinations, and lasting only a few days, sometimes a little over a week. In a very limited number of cases the confusion was very active and attended by decided hallucinations of hearing and possibly of the other special senses. Such cases then assumed the character of an active hallucinatory confusion, which in one instance approximated, at intervals, an active delirium. It must be emphasized that such cases were very few, and in them the duration was likewise very short. In but one instance was the affection prolonged over several weeks. This is again in marked contrast with our previous experience in postinfluenzal psychoses. I should add that in two instances its symptoms superficially suggested paresis. In these the serological examinations proved negative. In one case, that of a young girl, the symptoms suggested a dementia precox. On the whole, however, the symptoms were such as supervene after other infectious processes, such for instance as were in former years observed every now and then after typhoid fever, or are still occasionally observed in the post-febrile periods of pneumonia, erysipelas, rheumatic fever, septicemia, and like affections.

The pathology of the processes at work appears to consist in the formation of late toxins; that is, toxins secondary to the original infection and the origin of which is probably due to a failure of the normal defensive reactions of the organism, *e.g.*, to an inadequate or pathological response of its glands of internal secretion and other structures. It is probable that in an infection in which late toxic sequelæ are absent, the organism successfully resists and disposes of the toxins relatively speedily and promptly. When this is not the case it is probable that secondary disturbances of function of the thyroid, the adrenals, the liver, possibly of the kidney and of other glands and structures, are established. Consequently a disorder of metabolism ensues which constitutes in reality an autointoxication, an autointoxication secondary to the original infection. An interesting parallel is offered by the confusional insanity which results in given instances from alcohol. Here a mental confusion is established which persists for many months after alcohol has

ceased to be ingested. The condition is clearly toxic in nature, and yet, persisting as it does after alcohol has been withdrawn, must be due to some other poison or poisons. Clearly the persistence of the symptoms must be due to autogenous poisons—poisons which are the result of disturbance of function in various glands and other organs induced by the alcohol. This disturbance profoundly affects the substances normally elaborated and thrown into the circulation by the various glands and tissues. It seems equally probable that in postinfectious confusions and kindred mental disturbances—disturbances which last long after the initial affection has passed away—we have likewise to deal with problems of autointoxication secondary in character.

It is extremely probable that the recovery which ensues in the postinfectious confusions and deliria results from the gradual establishment of immunity—*i.e.*, from the gradual formation of antibodies. The formation of the antibodies is slow and difficult, due first to the fact that the organism is weak and exhausted, and secondly, probably to the fact that the toxicity from which the patient suffers is multiple and complicated. Recovery, however, finally ensues; this is the rule in the vast majority of the postinfectious psychoses, and is equally true of the postfebrile deliria and confusions of influenza.

How can such a recovery be hastened? The first indication is evidently to assist, if possible, the formation of antibodies. How can this be accomplished? Evidently the resources of the organism are increased by adding to its substance, and the first indication is to give an abundance of nourishment, to practice full feeding, just as we do in tuberculosis and in states of depressed nutrition generally. Full feeding does more than add to the weight of the body and to encourage the repair of exhausted tissues; it distinctly favors the formation of lipoid substances—substances which we know play a most important rôle both as antigens and antibodies.

The second indication is rest. Rest is closely and naturally associated with hypernutrition; indeed, it is a veritable prerequisite of hypernutrition. That rest, especially in the postinfectious mental disorders, should be absolute and complete follows as a matter of course; and that it should be continued until convalescence is established—not only for weeks but if necessary for many months—is equally evident.

The third indication is that of keeping freely open the various avenues of elimination. This embraces the judicious use of laxatives, the free administration of liquids, and finally judicious bathing. For cases of confusion following influenza, a daily warm sponge bath given between blankets not only maintains the activity of the skin, but also tends to soothe and quiet the patient.

The next indication is the production of sleep. If the patient be much disturbed, excited, and struggling, sleep may be abolished altogether, and the production of sleep then becomes one of the most important indications. Simple physiological methods, such as the bath, usually fail under these circumstances. Grave and even fatal exhaustion may supervene and an otherwise recoverable case may die or the illness be greatly prolonged unless sleep be secured. While many of the cases resulting from the recent epidemic of influenza were mild in character, and sedatives were only occasionally indicated, there were others in which the indication for the use of these remedies was insistent and imperative. To withhold them under such circumstances is to add seriously to the risks of the patient, for every now and then a patient dies from the exhaustion which the struggling and the want of sleep induces. Many of the hypnotics at present at our disposal give rise to a sleep which is like the natural sleep and are not attended by unpleasant or unphysiological effects. Not only does their judicious use do no harm, but there is reason to believe that in addition to inducing rest and sleep and thus conserving strength, sedatives also favor the formation of lipoid substances and in this way actually stimulate

the formation of antibodies. However this may be, their use in suitable cases is followed not only by sleep but by a gain in strength. Regarding the choice of the sedative to be given, it must be borne in mind that because of the disturbed condition of the patient it may be difficult to administer the medicine by the mouth. Under these circumstances hypodermic medication of course suggests itself. Here it is important to bear several points in mind. If morphia be selected as the sedative, it is wise to associate the latter with a small dose of scopolamine; a much smaller dose of morphia is required if employed in this way. For example, one-eighth of a grain of morphia combined with one two-hundredth or at most with one one-hundredth of scopolamine will give rise to a very marked sedation and quiet, greater indeed and more satisfactory than when one-quarter of a grain of morphia is given alone.

There is one remedy, however, which is much superior to the combination of morphia and scopolamine, and in fact to any other remedy, in excited and disturbed states, and that is luminal, a member of the group to which belong veronal, medinal, and adalin. Luminal, attention to the value of which was especially directed by Richard Eager of the Devon County Asylum, Exminster, England, has a truly remarkable effect in quieting disturbed cases. It is efficient in relatively small doses—for example, in a grain and a half to two or three grain doses. Its special value is enhanced by the fact that it is also supplied in the form of luminal sodium, which is very soluble and in every way suited to hypodermic administration. I have myself employed it in this manner in three-grain doses. It is rapidly absorbed and the effects become evident within twenty minutes. This dose may be repeated at four-hour intervals, though this is rarely necessary; usually two doses in twenty-four hours amply suffice. Caution should be exercised lest, as occasionally happens, an unduly prolonged sleep is induced. Unfortunately the supply of luminal and of luminal sodium, which were foreign products, has been practically exhausted in this country, but no doubt the conclusion of peace will again make this much-needed and valuable remedy freely available. Lately some of our own chemists have succeeded in manufacturing it.

The purely nervous affections following the epidemic were not numerous—*i.e.*, compared with the enormous number of influenza cases. However, some of them appeared late and were—and still are—very serious and grave. Those appearing early were as a rule less pronounced and less serious. It was not unusual to note, for instance, that after an attack of influenza the patient was nervous and asthenic; *i.e.*, a nervous exhaustion supervened. Only occasionally did this prove marked and persistent. In two instances the writer observed well-marked hysteria; in both the hysteria was associated with gross clonic movements. As regards organic nervous affections, the writer saw in one instance a mild, diffuse sensory neuritis which rapidly subsided. Severe neuritis, such as had been observed after grippe other than the recent epidemic, was not met with. This seemed also to be true of gross or pronounced lesions of the cord. As regards the brain, however, the story that is at present unfolding itself is very different. Thus a young man twenty-two years of age presented himself at the nervous clinic of the Jefferson Hospital with the statement that in October of 1918 he had been ill in bed for some two weeks with grippe, and that he had not been well since. He stated that he was very weak and readily exhausted, and that, in addition, for two weeks past his eyesight had been becoming impaired. An ophthalmoscopic examination revealed an atrophy of the optic nerves. A careful search for other physical signs resulted negatively; station, gait, reflexes, sensation, were normal, while the serological examination of both blood and cerebrospinal fluid revealed a negative Wassermann and no pleocytosis, no increase of globulin. Here, obviously, is an instance in which changes in the optic nerve together with the persistent asthenia are legitimately

to be referred to the attack of influenza. Are we confronted here by the late persistence of postinfectious toxins? This would seem to be a probable explanation. In another instance, a man who had likewise passed through an attack of influenza in October, and who had apparently made a recovery, began complaining of headache in the early part of March, 1919. When examined at the clinic it was found that he presented double vision, unequal pupils, and an impaired light reaction. Other physical signs were absent; mental integrity was well preserved; serological examinations of blood and cerebrospinal fluid were negative. In spite of the interval of several months intervening between the attack of influenza and the later appearing symptoms, it again seems legitimate to refer the latter to the influenza. An encephalitis limited in extent and involving the nuclei of the oculomotor nerves would offer a probable explanation.[1]

The subject becomes still more interesting when we call to mind the cases of so-called encephalitis lethargica which are now being met with with increasing frequency. One such patient the writer saw in consultation with Dr. P. N. Bergeron at St. Mary's Hospital, Philadelphia. The patient was a man, thirty-four years of age, had suffered from an attack of influenza in October, 1918, had apparently made an ordinary recovery, but in March, 1919, had begun to suffer from headache. Soon he became apathetic and somnolent. He lay in bed absolutely motionless. The eyelids were drooping, the pupils rather small, with a very limited light reaction. The globes were limited in their movements, and for a time there was present a diplopia. An ophthalmoscopic examination revealed some edema of the eye-ground. The temperature was but slightly elevated. The extremities were weak and the reflexes of the legs possibly a little exaggerated. The Wassermann of the blood and spinal fluid was negative; the fluid, however, presented 13 cells per cmm. and a slight increase of globulin. The symptoms persisted with but little change for a period of about ten days, when death ensued. Unfortunately an autopsy could not be secured.[2]

Two similar cases—one almost parallel—are still under observation at the Jefferson Hospital. The symptoms in all three closely suggested, when examined, superior polioencephalitis. The symptoms point to lesions grouped about the aqueduct of Sylvius and involving the nuclei of the oculomotor and other nerves.

That cases of encephalitis lethargica do not belong to the group of the poliomyelitic affections is I believe exceedingly probable. They seem not to constitute a new or independent affection, but are to be regarded as one of the possible sequelæ of influenza. It is very astonishing, however, that so long an interval, an interval of several months, should intervene between the attack of influenza and the appearance of the encephalitis. In most of the cases the patient, too, had apparently made a recovery from the original attack, at least sufficiently to resume his ordinary manner of living; though in others he had not been entirely well afterward, and so stated in the account of his case. Finally, it would appear that in cases in which late sequelæ had followed influenza, immunization had been incomplete, so that a failure of the defensive reactions—the failure to maintain the formation of antibodies—permitted a fresh activity of the infecting organism. If these inferences be correct, we have here an analogy—a gross analogy perhaps—in the late appearance of parenchymatous syphilis, paresis, and tabes; for these affections come on, as is well known, long after the original infection, at periods of life when the defensive reactions begin to fail.

The above considerations have a serious and practical bearing upon our attitude toward patients apparently recovered from influenza. The possibility of recovery being incomplete should always be borne in mind. Such patients should be well fed, should be made the subject of tonic and other reconstructive measures, and should be warned against inducing undue fatigue and of resuming their former employment too soon.

[1] This and the preceding case were presented at the meeting of the Philadelphia Neurological Society, March 28, 1919, by Dr. Sherman F. Gilpin, Chief of Clinic.

[2] This case was reported at the meeting of the Philadelphia Neurological Society, March 28, 1919, by Dr. Bergeron.

ACIDOSIS IN CHILDREN.[1]

BY J. P. CROZER GRIFFITH, M.D.,
Professor of Pediatrics in the University of Pennsylvania.

By the term "acidosis" is designated that condition in which acid substances are present in the blood in quantity relatively so increased that the normal excess of alkali is much diminished. Experimentally acidosis with its symptoms has been induced in rabbits by the administration of hydrochloric acid in large amount. In man it depends upon a relative excess of organic acids produced in the human economy. The acidosis may in some cases be accompanied by the presence in the urine of the acetone bodies, consisting of *B*-oxybutyric acid, diacetic acid, and acetone. In other instances it is certain that the acid bodies of this group are not concerned in any way with the process. The relative excess of acid in the blood depends either upon an overproduction of acid bodies; on a loss of bases from the organism; or on the failure of the kidneys and the lungs to excrete the acid in sufficient amount. It is important to bear in mind these varying causes. Thus, for instance, the removal of alkali from the system produces an acidosis equally well with the formation of an excess of acid, and even entirely without the occurrence of this. It is the *disturbance of the balance* which is the important matter. It is the relative decrease of alkali in the blood which is the cause; not the mere presence of acid.

At once a sharp distinction must be drawn between acetonuria and acidosis, and reference is made to this on account of the very common custom of viewing acetonuria as an indication of a necessary presence of acidosis. The former consists merely in the occurrence of the acetone bodies in the urine. It has repeatedly been shown that these bodies in small amount may be present in the urine of normal, healthy children. The amount may be increased under certain pathological conditions, such as starvation, acute febrile diseases, severe diarrhea, diabetes, intestinal autointoxication, and recurrent vomiting; but remains merely a *matter of excretion* and may not be accompanied by any symptoms of acidosis. Acidosis, in contradistinction to acetonuria, indicates a decrease in the alkali of the blood, irrespective of the actual amount of acetone bodies or of any other acids which are being excreted. It is accompanied by a decrease of the carbonic dioxide tension of the alveolar air, an increase in the hydrogen-ion concentration of the blood, and a great lessening of the reserve of the alkali in the blood.

Two facts are brought prominently to our attention in the matter of acidosis in children. The first depends upon the statement just made—*i.e.*, that acidosis and acetonuria are distinct. Consequently the discovery of the acetone bodies in the urine of a starving child—*e.g.*, one with vomiting, who as a result is suffering from a condition of emptiness—is almost a necessary occurrence, or at least one to be expected, and need not of itself cause alarm. We make a mistake in calling such a condition acidosis. So, too, probably half of the instances of acute febrile diseases in early life will exhibit acetone in the urine. Acetonuria may, it is true, be accompanied by acidosis; but some of the worst cases of the latter condition exhibit no acetone bodies whatever in the urine. It is only by the occurrence of *symptoms* of acidosis, or by laboratory tests, such as those of the alveolar air and of the blood, that the relative excess of acid in the blood and tissues can be determined.

The other fact is equally important, viz., that children seem especially prone to develop the symptoms of acidosis. There appears to be no doubt of the truth of this. It may depend upon the smaller reserve of alkali which is characteristic of early life, or upon the facility with which children manufacture acid bodies without any discoverable sufficient reason.

Although we think naturally of acidosis in connection with diabetes in children, there are other causes much more frequently op-

[1]Part of a Symposium on Acidosis, before the Philadelphia County Medical Society.

erative. This is merely because of the relative infrequency of diabetes in childhood and infancy, since in my experience most dangerous acidosis develops in diabetes in early life with the greatest readiness. I have seen a diabetic girl of 3¼ years plunged from a splendid general condition into fatal coma by an ill-considered change in the diet. Such a case is unfortunately far from being an isolated one.

Another condition in childhood which has repeatedly been attributed to an acidosis is recurrent vomiting. I have never been able to convince myself that acidosis was in reality the cause in such cases. It is true that the acetone bodies appear in considerable amount; but we must remember that a condition of starvation is present, which accounts naturally for this symptom. It would be only by laboratory tests that we could with reason attribute recurrent vomiting to an acidosis, or by the development of characteristic symptoms; and repeated vomiting is not one of these. The title "acetonemic vomiting" which has been applied to this disease is consequently misleading, in that it confuses a problematical cause with a certain effect.

A prominent cause of acidosis, especially in infancy, is severe diarrhea of a non-inflammatory form, in which there is a large loss of liquid from the intestine. Many of the cases of "milk-poisoning," "food-intoxication," and the like, belong in this category. To the previously existing symptoms of the diarrheal state, with great reduction in the amount of urine, are added the toxic ones of acidosis. This is a class of cases in which it is certain that the acetone bodies are inoperative. Whether it is a retention of acid phosphate, the presence of lactic acid, the reduction of the bases, or some other cause, is not clear; but there is without doubt a very large loss of alkali in the diarrheal discharge, and it is very probable that this is the active agent. Then there is also a certain class of cases in early life which develop acidosis without any discoverable reason. The most typical instance of acidosis which I have seen, so far as symptoms go, was one of these. The girl exhibited coma and very characteristic hyperpnea; yet there was no history of diabetes, diarrhea, or starvation, or, in fact, of any other sufficiently explanatory cause. Certain other conditions may bring about the development of acidosis, among these being nephritis and occasionally pneumonia. It is very often probable that the symptoms attributed to uremia are in reality those of acidosis.

The ideas held by many upon the subject of the symptomatology are rather vague. There are, it is true, some suggestive symptoms, but only few which are positive evidence of acidosis. Among the early symptoms are restlessness, sleeplessness, and excitement; and later the development of somnolence, prostration, and coma. When these appear in a case of diabetes, or in an infant with severe summer diarrhea and great diminution in the secretion of urine, acidosis may be suspected. The only positive symptom, however, apart from laboratory tests, is hyperpnea. This consists of deep exaggerated inspiration and expiration, somewhat increased in rapidity, and constantly present. The symptom may be only slightly marked, or may reach a degree of dyspnea sufficient to constitute "air-hunger," yet without discoverable organic or functional disturbance of the heart or lungs to account for it, and without cyanosis.

Acidosis is always a serious matter. When well-marked symptoms of it occur in a child with diabetes, the condition may perhaps be relieved by treatment, but will almost surely return later. This is true of adults as well. The same is true also of well-marked acidosis in any other condition, as, for instance, in the food-intoxication and severe diarrhea of infancy. Once the symptoms have become well developed, the prognosis is bad. Even although they are temporarily abated, and the alkali reserve of the blood reinstated, death will probably follow for reasons which we do not understand.

This brings us to the treatment, and this can profitably be condensed in a few words. It must be *preventive*. Should any condi-

tion be present in which acidosis is known to be liable to develop, this development must be guarded against. In the case of diabetes the greatest caution must be used in cutting off the carbohydrates without a simultaneous removal of the protein and of the fat. Any other course is dangerous. In fact, starvation is the only proper method of beginning treatment. In severe diarrhea in infancy prompt measures must be used to check the large loss of alkali from the system by way of the stools. Initial purgation in such severe cases is more than useless; it is dangerous. If there is no evidence of the presence of irritating substance in the bowel, as shown by the character of the stools and by fever and abdominal distention, astringents should be at once employed, and especially opium. In addition, in all cases where we fear the development of acidosis there should be a free administration of alkali, especially bicarbonate of soda, and enough should be given to keep the urine alkaline. Even in cases of well-marked acidosis the effort at least should be made to relieve the condition by restoring the alkali reserve. The salt may be given by the mouth, or, if vomited, by the bowel, or still better intravenously. Attention must be called to the fact that for the purpose of giving bicarbonate of soda subcutaneously, the solution must be specially prepared. Boiling it for the purpose of sterilization reduces it to the carbonate, which is very irritating. In addition, in all diarrheal cases care must be taken that a large amount of water is administered in some way to replace that which has been lost from the intestine.

The treatment for acidosis from any other cause is similar. Unfortunately, so far as preventive treatment is concerned, we have little to guide us in the matter of anticipating the condition.

SIX MONTHS' EXPERIENCE WITH DICHLORAMINE-T IN THE LOCAL PREPARATION OF THE SKIN BEFORE OPERATION.[1]

BY MOSES BEHREND, M.D.,
Surgeon to the Jewish and Mt. Sinai Hospitals, Philadelphia.

In the past twenty years many methods of sterilizing the skin before operation have engaged the attention of surgeons and bacteriologists. The object sought from all these procedures was the elimination as far as possible of the ever-present bacteria of the skin, thereby rendering the field of operation sterile. The greatest difficulty lay in the fact that even after a thorough preparation there were still present the various staphylococci, though many were of the non-pathogenic variety. Not any of the methods employed thus far has given the surgeon that absolute confidence that no infection will result after operation.

In the writer's memory as a student, when the principles of asepsis and antisepsis were being taught, there was a wide range of opinion amongst the leaders of surgery of what constituted the proper preparation for the operator and the field of operation. Gradually, however, as the attempt at uniformity shaped itself a unanimity of opinion as to the proper method of aseptic preparation was formulated. While the patient was on the table the usual method of procedure was a thorough scrubbing of the field of operation with soap and water, followed by a solution of bichloride of mercury and alcohol. The results following this procedure were excellent, but the great objection was that the patients were compelled to lie in a wet field during the course of the operation. The facility and speed in operating did not obtain the degree of efficiency that we have to-day, and often patients would lie thus for an hour or two. This resulted in chest complications, of which pneumonia was the most frequent. The so-called ether pneumonias were much more common than they are now. The advent of the "wet" preparation of the patient outside the operating room and the application of the tincture of

[1]Read before the Northern Medical Association of Philadelphia.

iodine or other antiseptics just before the operation were distinct advances in our surgical technique. The adoption of this method was universal, as the dry method appealed to the surgeon immediately. Also bacterial controls showed less numerous bacteria after the application of iodine than after the soap-and-water method.

The writer used iodine exclusively for many years, then McDonald's solution was substituted. This solution was as satisfactory as iodine, infection occurring not any oftener than with other antiseptics. However, soon after the United States entered the war one of the ingredients used in making McDonald's solution became so expensive that we had to resort to the use of iodine again. We have had ample opportunity to note the comparative results obtained with the use of iodine and McDonald's solution, but there does not seem to be any difference so far as results are concerned. Massive infections are noted with both occasionally, while stitch abscesses and slight infections are also observed. Since the latter part of June, 1918, dichloramine-T has been used in my service at the Jewish Hospital for the local preparation of the skin before operation. In the Mt. Sinai Hospital up to October, 1918, iodine was still used in my service as the local antiseptic. Here too the opportunity for comparative study was presented. In the Jewish Hospital, out of 168 operations 88 were abdominal and the remainder miscellaneous in character. When we had sufficient time the patient received the usual local preparation of the field on the morning of the operation. Many of the above were emergency cases, and these received no preliminary scrubbing, but simply the application of ether and dichloramine-T before operation. The severest test a new solution can be put to is to apply it to emergency cases in which the preliminary scrubbing of soap and water has never been used. Then again in bone operations, where one's surgical technique must reach the height of efficiency, dichloramine-T has been used with fine success, and it seems to me that knowing the peculiarity of bone to become infected dichloramine-T has been put to a very severe test.

The reason for the attempt to displace iodine was threefold: First, on account of its property to increase intra-abdominal adhesions; second, on account of the large numbers of cases that received skin blisters; third, because one solution was desired for the field of operation and the surgeon's hands.

Experimentally we have shown without a doubt that iodine carried into the abdominal cavity on the fingers and applied to the abdomen increases abdominal adhesions. This was fully outlined in our paper read before the Pennsylvania State Medical Society last September. The use of dichloramine-T showed an absence of adhesions in several consecutive animals, but our hopes of having found a perfect antiseptic and one that will not stimulate intra-abdominal adhesions were shattered when we noted adhesions in a few of the animals reoperated upon. The adhesions seen were filmy in character, easily separated, and no doubt would have been absorbed in the course of time.

Up to the present time we have seen, in the entire series prepared by the ether and dichloramine-T method, the skin irritated in one case following an abdominal operation, whereas after the use of iodine this condition was often observed.

In the operating-room it is desirable to have simplicity of technique, which can best be attained by the use of one solution for both the patient and the surgeon. McDonald's solution and dichloramine-T both accomplish this result. For years in most clinics it had been the custom after the hands were thoroughly scrubbed in soap and water, to immerse them in sterile water, bichloride of mercury, and finally alcohol. For the sake, then, of simplicity of technique only these solutions were discarded, and instead dichloramine-T was used on the hands after a thorough scrubbing in soap and water.

This method of preparing the hands before operation was used three months, but had to be discontinued on account of a very

annoying dermatitis appearing on the dorsal aspect of the writer's hands. The eruption was painful, especially at night, and interfered with the performance of operations for several weeks. We then used again the old time-tried solutions, and after my hands were perfectly well dichloramine-T was again tried, but with the same results as mentioned before. It was then discontinued as part of the preparation of the hands before operation, but we still employ it on the patient's skin just before operation.

The irritant quality of the long-continued use of dichloramine-T has long been recognized. It was thought that irritation resulted only after the solutions were old. However in my case they were made fresh before every series of operations, so that the skin irritation cannot be attributed to the hydrochloric acid which forms when the solutions have spoiled.

In conclusion it may be stated a distinct advance has been made in eliminating the soap and water, bichloride and alcohol preparation of the skin immediately before operation.

The aim of all surgeons should be simplified technique, and the adoption of one solution for both the patient and surgeon. This course will eliminate a multiplicity of basins and consequently as many sources of infection.

While infection of the so-called clean case is infrequent, there has not been noticed an appreciable difference after the use of dichloramine-T.

It must be admitted, however, that dichloramine-T has found a place in the armamentarium of the surgeon on account of its ability to resist infection.

While we have proven experimentally that dichloramine-T gives rise to less intra-abdominal adhesions than iodine, we have not been given the opportunity to reoperate on any patient on whom this chemical has been used.

MUSHROOMS AND TOADSTOOLS.[1]

BY HOWARD A. KELLY, M.D.,
Professor of Gynecology in the Johns Hopkins University, Baltimore.

The amount medical men are expected to know, and the sciences they are supposed to compass outside of their own handicraft, must often seem like a hardship and a genuine cause for grievance, and yet I have never heard any one complain. It is a simple enough fact in mechanics that if the bucket is full of water, you cannot reasonably expect to add another quart without seeing it slop over and go to waste. But it is a physiological paradox that though you fill the mind full to the brim you can keep on adding more and yet more indefinitely, and still, though ever full, it never seems to reach its limit of capacity. He who early discovers this secret in life is the one who forges farthest ahead of his competitors in the field of endeavor and research.

I write the above as an "apology" and by way of introduction to a new and important science, into which I would like to entice the medical profession, for in every large community there should be enough men interested in mushrooms and toadstools, in other words in fungi, to form a little club for their study and for the promotion of useful knowledge about them. Lower orders of fungi we do touch daily in dealing with infectious diseases, but the higher members of this group have been neglected.

My reasons for urging the entrance upon this new field are:

1. It is important from a purely medical point of view, for judging from reports I follow in the daily press from year to year there are at least one or two hundred deaths in the country at large from mistakes in identity and eating poisonous species.

2. Another reason is an economic one,

[1]Opening up an old yet new subject to the profession, dedicated to Sir William Osler, Bart., on the occasion of his seventieth birthday this July, when he is proving himself the best refutation of his jesting computation of the years of a man's usefulness.

namely, that we actually import about forty million pounds of mushrooms every year, while vastly greater quantities of excellent esculent fungi decay in our own fields and forests, because of our superstitions about "toadstools," and because we are too ignorant to discriminate between the very few poisonous kinds and the many good ones.

3. Also, and by no means least of the cogent reasons, anything which will take the doctor out into the fields and draw him closer to nature in cultivating a new hobby

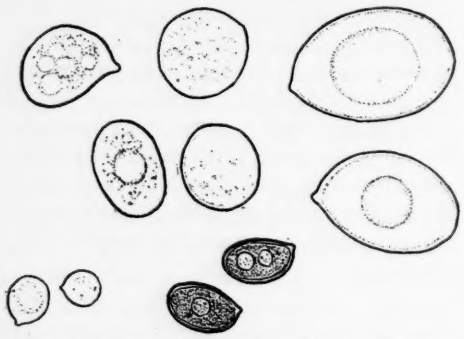


FIG. 1.—Spores of *Amanita muscaria*, *Amanita phalloides*, *Lepiota procera*, *Agaricus campestris*, and *Clitocybe illudens*. Scale of enlargement the same.

is a good cause worthy of zealous promotion.

I shall try in this brief article to point out some of the characteristics of our gill fungi (for the most part), I shall give as clear a description as I can of the few poisonous species that they may readily be recognized, and then I shall name and describe some edible forms also easily identified, which ought to be put on our dietary lists at once all over the country, concluding with a word about cooking them.

To begin with, discard the terms "mushroom" and "toadstool," as designating in any way whatever the good and the bad species; as a matter of fact most "toadstools" are excellent eating, many every whit as good as the common well-known field mushroom.

To introduce a modicum of science, which is the very breath of medical life, let me explain that the group I am about to speak of belongs to what are called Basidiomycetes, that is to say if I scrape a little tissue from the gills of a mature specimen and look at it under the microscope, I find in all gill, teeth and pore-bearing fungi, as well as in puffballs, a stout, club-like cell called a basidium, with four minute points, each point bearing a little spore or seed; four spores are formed; just four and no more characterize and unite in one group the thousands of species of gill fungi and their congeners with teeth and pores. In each one of these exquisitely minute seedling spores, lighter than the gentle breezes of heaven, and just a few thousandths of a millimeter in diameter, are lodged all the marvelous individual peculiarities which mark the vast numbers of varieties of the fully matured fungus and that too without any semblance of sexual reproduction. Time and space fail, or I would dwell at length on the beauties and the wonderful differences found in the shapes and characteristic surface markings of these spores themselves, differences of the utmost im-

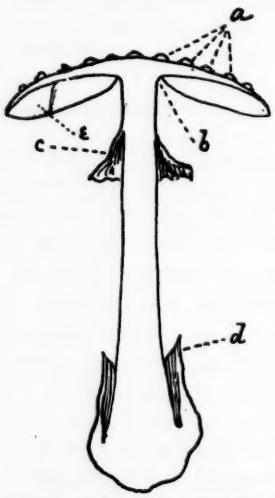
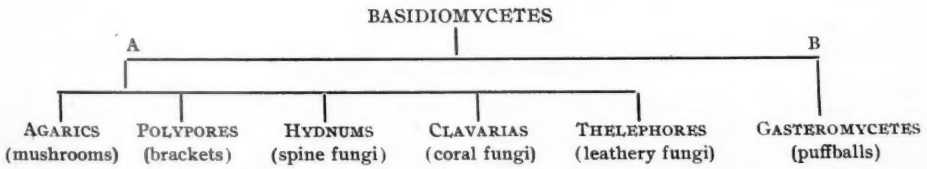


FIG. 2.—*Composite picture* of an Amanita. (*a*) Warts on cap, (*b*) free gills, (*c*) ring, (*d*) volva or "death-cup," (*e*) short or dimidiate gill.

portance in their recognition and classification (see Fig. 1). Remember then this term basidiomycetes, and now let us go afield basket on arm and with a knife (a ten-cent-store potato peeler is a good kind) and some paper bags or waxed paper, to separate the specimens and to keep the dirt off from the others, as we collect and store

them away. Gather a few of every kind you see, both young, mature, and old, from trees, forest floor, and field; later when your eyes are opened by practice you will realize how many you missed on your first trip. There are four groups of these larger fungi which you will notice with interest in forest and field as soon as you begin collecting all belonging to the "basidios" (to abbreviate the term), though three have no gills. You will first be apt to discover a surprising variety of the toadstool-mushroom group with gills, and as you take note of stem and gills and cap you will be astonished at their wonderful differences, a few simple characters, and hundreds, nay thousands, of varieties of form and color, all designed to attain the same end of abundant spore production and distribution. If you feel no thrill as you contemplate these things then quit the business, for you are not a mycologist and profane feet must not sully sacred ground. Here and there in a field you will find the esculent puffball, perhaps one as big as your head. On logs and trees the shelf-like fungi (polypori) with their myriads of pores, also lodging and shedding their spores, will again attract attention as they did years ago in boyhood's utilitarian days, when you designed brackets from them. Here and there, too, occasionally others will be found with teeth and spines instead of gills (hydnums) and still others, fleshy and looking like mushrooms, yet provided with tubes like polypores instead of gills (called boleti). Let me make a little table just here to keep the matter clear:



The five groups under A all have the spores exposed on a membrane, as they are developed, while the one under B, the puffballs, have their spores shut up in the bag of the puffball until ripe and ready for discharge.

The very first desire of a would-be collector and cultivator of this, as a new field, is naturally to be able to recognize and reject, as far as the dinner table is concerned, the poisonous forms, so the chiefest of all rules for the mycophagist (fungus eater) is *"Never eat any species you do not know well."* The next rule, a corollary from this one, is *"Go slow in adding to your list of edibles."* To this I add for safety's sake, don't rely on the judgment of another amateur like yourself.

The very worst poisonous species are fortunately grouped under one usually easily recognizable genus, and these are the AMANITAS (see Fig. 2). When you hear that a party of Italians or Lithuanians or Hungarians or Russians went out into the country some Sunday and gathered and ate a lot of mushrooms, and that some of them died in a few hours or days, it is always an Amanita which is at the bottom of the mischief.

The Amanitas are recognizable by more or less of a boot, or ragged remains of one, at the bottom of the stem, and a ring well above on the stem. They commonly grow in or near woods and are among our most attractive and beautiful species, the very aristocrats of all the fungi.

A charming writer and a great authority, C. H. Kauffman, in two delightful volumes on gill fungi, just out from the press of the Michigan Geological and Biological Survey, pertinently says anent toadstools and table:

"Avoid the genus Amanita . . . Avoid all that are no longer fresh and firm, or which have small burrows due to grubs. Avoid the large colored forms until you are well advanced in the subject. All except the Amanitas may be tasted without swallowing with entire safety; avoid all that have a powerful peppery or nauseous taste,

. . . Avoid the green-gilled Lepiota. Avoid those with a milky juice until you know a great deal about them. Try the large white forms which grow on tree trunks. . . . Try meadow, field and street mushrooms. . . . My advice to all beginners and amateurs is: *Collect and study the deadly Amanitas first.*" He further says if you don't know the Amanita group so as to avoid it, and yet venture to collect and eat mushrooms, you are liable to fatal poisoning.

fragments or warts (appropriately known as the "death cup"), or simply as ragged remnants. (See Fig. 3 of *Amanita muscaria.*) In order to recognize this most important marking it may be necessary to dig up the Amanita with care as the cup may be concealed below the ground, when if you cut the fungus off above the cup you might easily be led to exclaim, "No cup, therefore safe to eat!" Also the Amanitas have a ring on the stem above the cup, just below the cap or pileus. No Amanitas

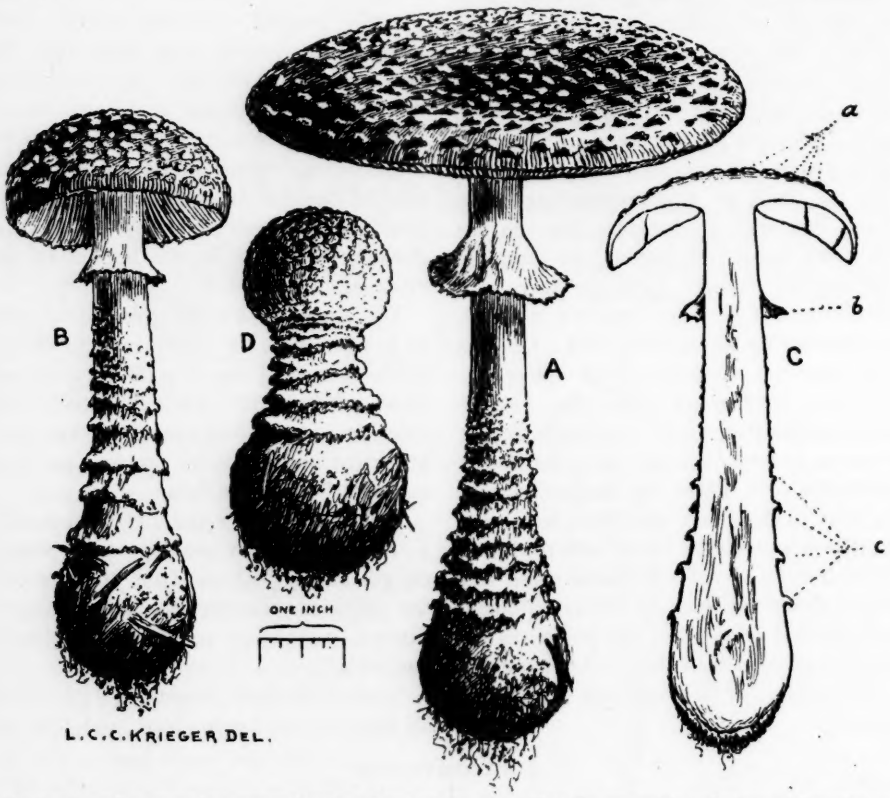


FIG. 3.—*Amanita muscaria*, common American form; whole series. Note the concentric scaly rings of the volva, as they are being formed by the growing plant, D and B.

To know the easily recognized Amanita group settles the question of any great danger to life in eating fungi, so let me dwell a little on the characters by which they are easily recognized.

First of all, when young, "in the button," they are egg-shaped and completely enclosed in a veil, or sac, which ruptures, as the cap pushes upwards, and remains attached at or near the bulbous base as a cup,

grow on trees, but all on the ground. The genus Amanita is a large one, but I figure here only two forms of the commonest dangerous species, *Amanita muscaria* and *Amanita phalloides,* and some of its varieties. *Amanita muscaria* (see Fig. 3), much used as a fly poison, whence its name, is one of the most beautiful objects in the vegetable kingdom, tall, graceful, often four to six inches across the top, and col-

ored blood-red, orange-yellow, or pale, and the top is characteristically sprinkled with clinging shreds (warts) of the cup or volva, which adhered and stuck there when the young growing plant broke through its investing veil. Below the cap there is a soft, fluffy ring (annulus) on the stem, and attached to the usually bulbous bottom of the stout stem is the cup or its remnants.

be laid on a piece of paper when mature they all shed white spores, and they have the distinguishing cup or volva, or its fragments, at or near the base. Our common edible mushroom has at first pink and then dark chocolate-brown gills, sheds dark purplish spores, and has a ring but no cup.

Regarding poisoning from eating amanitas, our own Dr. W. W. Ford is the leading

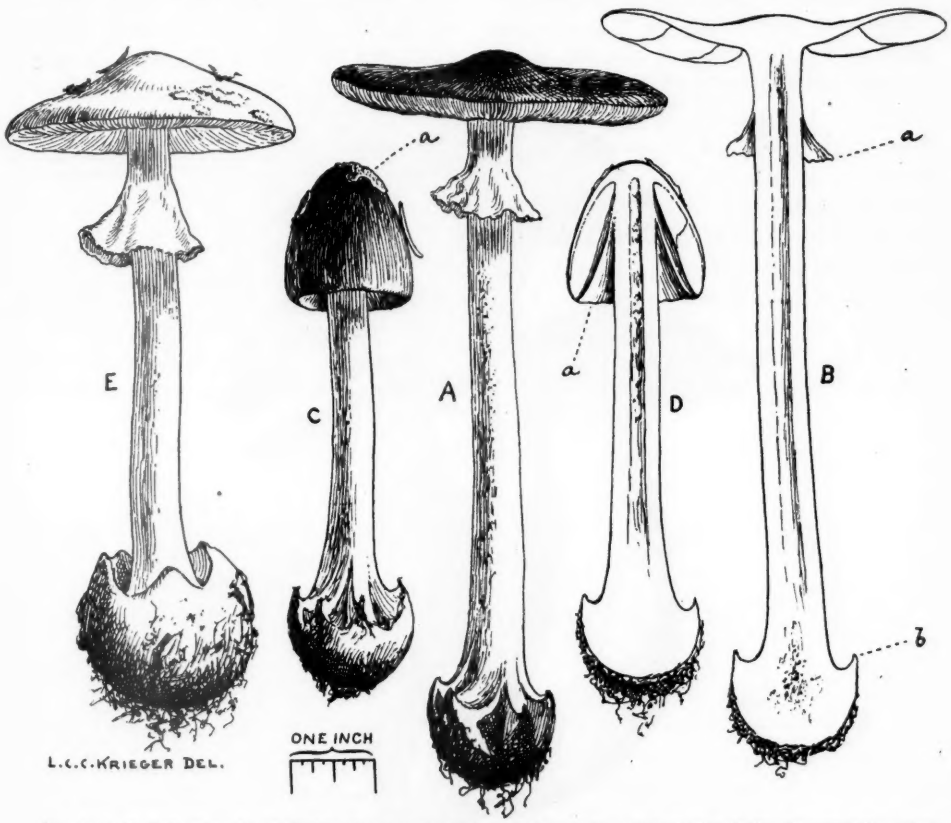


FIG. 4.—A, B, C, D, *Amanita phalloides*, the common dark-gray-brown form. Note the longitudinally split bulb, and the absence of the "free limb" of the volva. Patches of the volva are shown adhering to the cap at C (*a*).

E, The citrine variety of *A. phalloides* (or *Amanita citrina*, of some authors). Note the huge base with the thick segments of the "free limb" of the volva.

Amanita phalloides (see Fig. 4), the most deadly of all known mushrooms, is as large as muscaria, but is smooth, shining white, dusky, or lemon yellow, and not commonly carrying the marked remnants of the volva, or death-cup, sticking onto the top of the cap or pileus.

Many of the poisonous Amanitas are further distinguished from our edible mushrooms by having white gills, and if the caps

living authority, having spent much time in a long series of fruitful investigations, from which any one who wants the latest and most authoritative data must cull. Ford says that poisoning is usually not due to *Amanita muscaria* as it has a bitter taste,[1] and is not eaten in sufficient quantity to do serious harm. The symptoms

[1] On the other hand Dr. van Fleet ate of it, pronounced it delicious, and was very ill.

are due to the action of the active alkaloid principle muscarin, extracted by Schmiedeberg and his pupils Koppe and Harnack. If a small piece is eaten it produces dizziness and nausea, and pallor, with oppression of breathing, restlessness, spasms of the jaw, and coma. The symptoms arise from an acute intoxication which comes on soon after eating the fungus.

The treatment is first of all to administer atropine in large doses, as it is a perfect antidote for the muscarin. If the patient has not vomited freely the stomach should be emptied, and the bowels moved freely as soon as possible.

Ford says in refractory cases with bad heart action, distress, and coma, atropine should be given intravenously. The outlook in a case of *Amanita muscaria* poisoning is far better than in *Amanita phalloides* poisoning because the muscarin is not associated with the chronic degenerative lesions. Where the patient is profoundly depressed and collapsed stimulants should be given.

Almost all deaths come from eating *Amanita phalloides*, or its spring congener *Amanita verna*. The symptoms are practically always the same. There is a stage of from six to fifteen hours during which no symptoms are felt; then there is severe abdominal pain, and vomiting and diarrhea, with blood and mucus. The loss of strength is rapid, and jaundice, cyanosis and coma follow in a few days. Convulsions may terminate the scene. While the patient may die within two days, the disease usually runs about a week. There is no known remedy. Death follows if much has been eaten. One or two specimens may kill; even one-third of a cap has proven deadly.

FIG. 5.—*Clitocybe illudens*, Jack-o'-lantern; poisonous.

The differences between muscaria and phalloides symptoms are shown in the table. The treatment is to wash the body out at both ends and to wash through, to

use stimulants freely for extreme weakness, and a narcotic when necessary to relieve the severe pains.

PHALLOIDES.	MUSCARIA.
Action delayed six, eight or more hours; sudden onset, severe cramps.	Symptoms coming on soon after eating, within a few hours.
Vomiting, diarrhea; bloody, mucous stools; convulsions may be terminal.	Excessive salivation, perspiration, flow of tears.
Death in about a week.	Nausea, retching, diarrhea, watery stools, quickened respiration, dyspnea, bronchi filled with mucus.
No known antidote.	Giddiness and confusion.
Contains a powerful hemolysin, destroyed by heat and the gastric juice; also an Amanita-toxin, worked out by Schlesinger and Ford.	A large amount acts on the nerve centers predominantly and brings on delirium, coma, and what Ford calls "typical muscaria convulsions."
Identical with this species are *Amanita virosa* and *Amanita verna* (both figured).	The antidote is atropine. Ford says there are other poisons present besides muscarin, and atropine neutralizes only the muscarin.
Cooking does not impair the virulence of *Amanita phalloides*, as its poison is heat-resistant! (Ford).	Owes its poisonous character to muscarin, an ammonia derivative; Ford has also shown that it contains an agglutinin.

See also a splendid article by Dr. O. E. Fischer in Kauffman's book above referred to.

If it is possible to get hold of any of the early vomitus it ought to be saved in order to make a microscopic examination for the characteristic spores in attempting to identify the species. Put whatever can be obtained in alcohol or 10-per-cent formalin and send to the nearest authority.

Another poisonous species is known as *Clitocybe illudens* (see Fig. 5). This beautiful fungus is remarkable in that it is highly phosphorescent and is dubbed Jack-o'-lantern; it gives off enough light at night to enable one to distinguish print. It is a bright deep yellow or saffron or orange color, and grows in large clusters at the base of tree trunks, has a depressed center and thinner wavy margin, and gills which run down the solid stem. Center depressed from overexpansion of pileus; before this happens it is quite even, with a slight umbo or boss in the center. Don't mistake this for the excellent esculent Chantrelle. Its poison, not as virulent as those of the Amanitas, produces more or less violent gastrointestinal disturbances with vomiting and diarrhea; some do not seem to be affected by it.

Lastly let me mention several kindred smaller mushrooms which deposit black spores if laid for a time on white paper, which grow on dunghills, or rich soil, and are more or less conical or bell-shaped, called *Panæolus papilionaceus, P. campanulatus,* and *P. venenosus;* of these only campanulatus is truly campanulate. I would also call attention to the danger of confounding these with the ink-caps or Coprini. Panæoli are black-spored, but non-deliquescent. The importance of this is that it is apt to get mixed up with our common mushroom, especially when raised artificially in cellars. The effects are variable, and produce in some people speedy and marked hilarity, vision of non-existent colors, giddiness, and sometimes temporary paralysis of a limb.

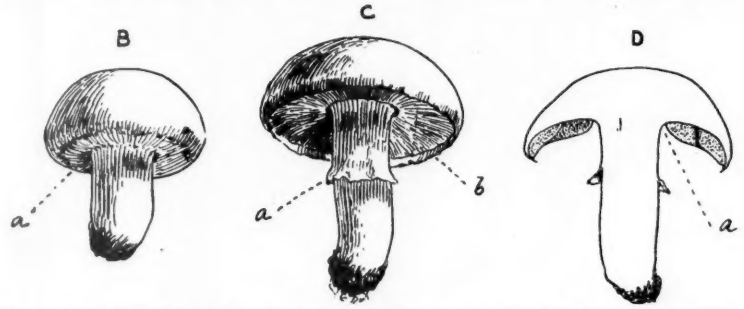


FIG. 6.—Our common field mushroom, *Agaricus campestris*. B, shows "button" bursting its veil.

EDIBLE FUNGI.

In order to make a start in the enlargement of our dietary list of edible fungi, let me describe the following species, all of which are easy to recognize, and are palatable; most of them, too, are widely disseminated:

The common field mushroom, *Agaricus campestris,* and the horse-mushroom, *Agaricus arvensis* (see Fig. 6).

The Parasol mushroom, *Lepiota procera* (see Fig. 7).

The Oyster mushroom, *Pleurotus ostreatus,* and its congeners (see Fig. 8).

The Chantrelle, *Cantharellus cibarius* (see Fig. 9).

Three species of Coprinus—atramentarius, comatus, and micaceus (see Figs. 10, 11).

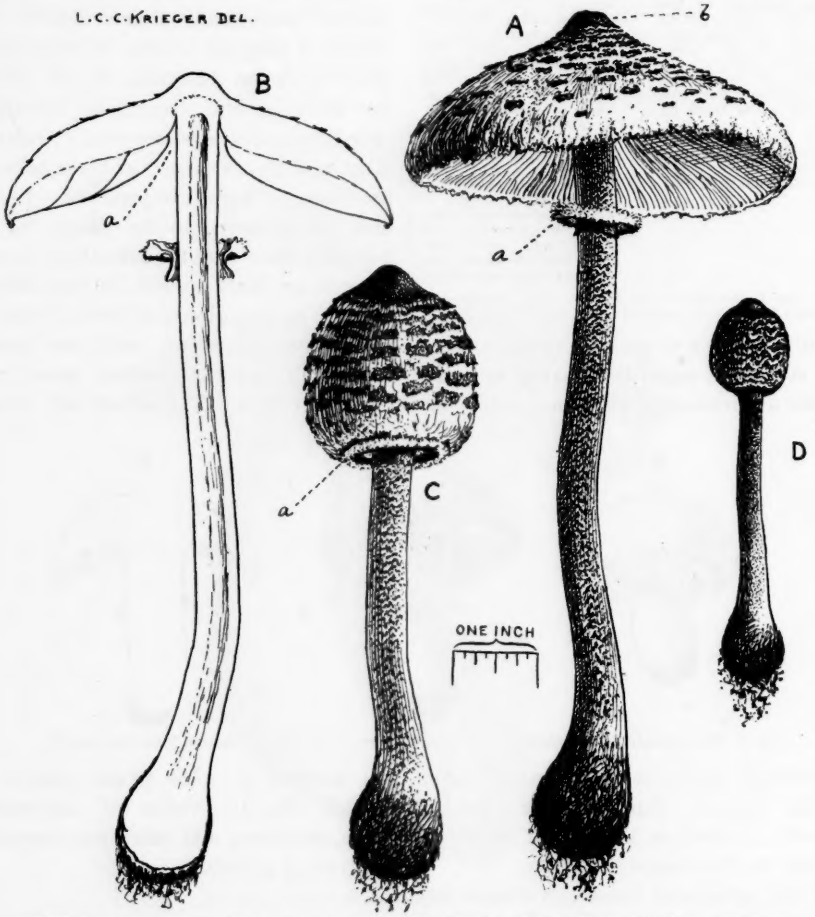


FIG. 7.—*Lepiota procera.* From extreme youth to full maturity. One of the best of all our mushrooms.

The Beef-steak mushroom, *Fistulina hepatica* (see Fig. 12).

Puffballs—*Lycoperdon gemmatum* and *Calvatia gigantea* (see Figs. 13, 14).

A Morel-Morchella—all morels are edible (see Fig. 15).

I shall describe them one by one, giving the characters by which each can be known readily. The pen-and-ink drawings are by my friend, Mr. L. C. C. Krieger, who is the leading living mycological artist, and an authority in this field of research.

Agaricus campestris (see Fig. 6), the common mushroom of the fields, has pink gills when it is young, turning dark purplish-brown as it matures, owing to the color of the spores. The pileus or cap is fleshy, and the stem is short and has a ring, which protects the gills while they are young. *Agaricus arvensis,* the horse-mushroom, is a coarser, larger plant with a strong amygdaline odor and a double ring on the bulbous stem. The lower ring is stellately split. The Parasol mushroom, *Lepiota procera* (see Fig. 7), is one of the most beautiful of all our forms, with its graceful stem with a ring, *but without any*

cup below, with a light-brownish, scaly top and with white gills not attached to but remote from the stem; if the cap rests for a few hours on paper it sheds abundant white spores. There is a poisonous species in this genus of Lepiotas, called morgani, which has green spores, and gills which become green. The stems of these two Lepiotas are inserted in a deep socket in the cap. Ring eventually becomes movable, like a bracelet!

The Oyster mushroom, *Pleurotus ostreatus* (see Fig. 8), is a most interesting and remarkable form, growing on trees, with its stem attached to one side, and grouped in large number in an imbricated fashion in the form of shelves one over the other. The stem is short, or almost none, and the gills are decurrent, running down the stem. The spore-deposit is white, or faintly grayish-lavender in a variety. The fleshy part, which corresponds to the pileus or cap of an ordinary mushroom, is soft and rather shell-shaped, bearing on the under surface the somewhat distant gills, delicate, soft, and white, bearing the spores. The upper surface of the cap varies in color, but is usually some shade of grayish or violaceous brown. In other pleuroti the gills are not decurrent.

FIG. 8.—Oyster mushroom, *Pleurotus ostreatus.* A, a cluster viewed from below. B, diagram of top-view showing imbricated mode of growth.

I think my own favorite of all the mushrooms is the Chantrelle (see Fig. 9), celebrated on two continents, and beloved of old for its esculent qualities. My sentiment is perhaps heightened by the fact that it is the first of the bright-colored toadstools I ventured to eat and to recommend to my friends, not without trepidation!

A Chantrelle, or *Cantharellus cibarius,* is one of the white-spored species, but is distinguished by the fact that its gills are much interconnected, with an obtuse edge, thick and fleshy, and run down the stem. In our species the stem is central, the pileus or cap is in the form of an inverted cone; its color, which is its most striking characteristic, is an unforgetable egg-yellow; it is also slightly depressed in the center. The stem is firm and solid and the flesh white. It is from two to three inches high and a couple of inches broad. Some smell like apricots, fresh and appetizing. (See Fig. 9.) Strange to say, there is a record where *Clitocybe illudens* was eaten for this species; for such an error there is no excuse.

The Coprini or Ink mushrooms (see Figs. 10, 11) are among the best of our edible species. I show here the two best known. They take their name "Ink Mushroom" from an extraordinary highly specialized property they have of self-digestion so as to liberate the spores as they ripen. These belong to the black-spored group, and so are at the opposite end of the scale from the white-spored Amanitas and Lepiotas, and Cantharelli. The juice of the Coprinus, which has been used for ink, would be most valuable if used in important documents, as the microscope would then readily reveal any tampering (Krieger). The inky deliquescence is not decay but perfect ripeness, and is but a way for the spores to escape from the crowded gills. The forms I show are easily recognized from the excellent drawings by Mr. Krieger. These species can be eaten up to the point of the deliquescence.

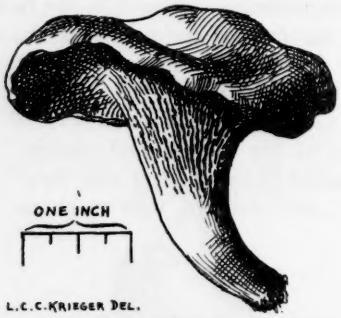


FIG. 9.—Chantrelle, *Cantharellus cibarius*. This is somewhat less than natural size.

The Beef-steak mushroom, *Fistulina hepatica,* called also Beef's Tongue, or by the French Langue de Boeuf (see Fig. 12), is a striking and easily recognizable form of an esculent fungus, often found in sufficient quantities to supply a large household. It belongs to the group with pores (polyporei) instead of gills, and is a bracket fungus growing from a tree, but unlike its congeners, the familiar hard forms, is soft and succulent. It is called hepatica from its liver color. The blood-red pileus or spore-bearing part is attached directly to the tree, or has a short stem; it is usually found on old chestnut stumps.

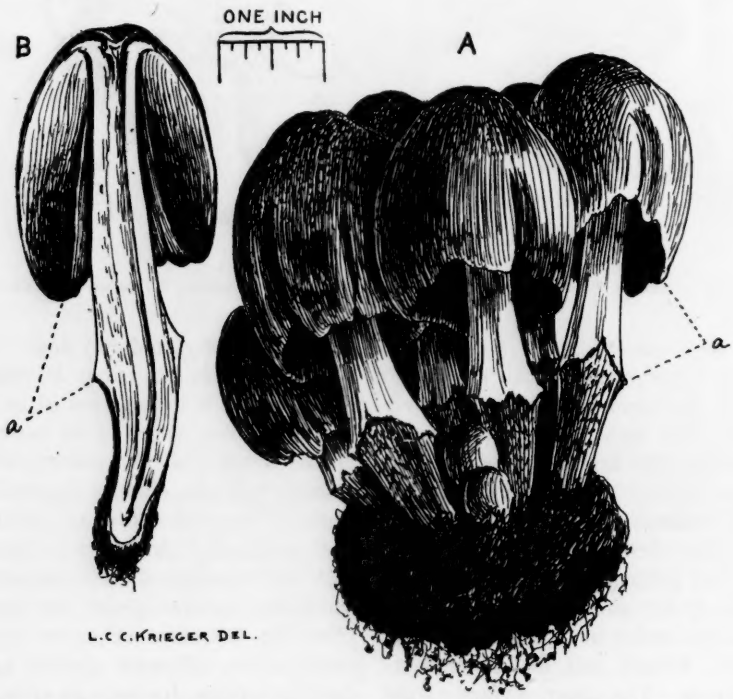


FIG. 10.—*Coprinus atramentarius* (one of the numerous varieties). At (*a*) in both figures is shown the characteristic veil" (it is really the edge of the volva).

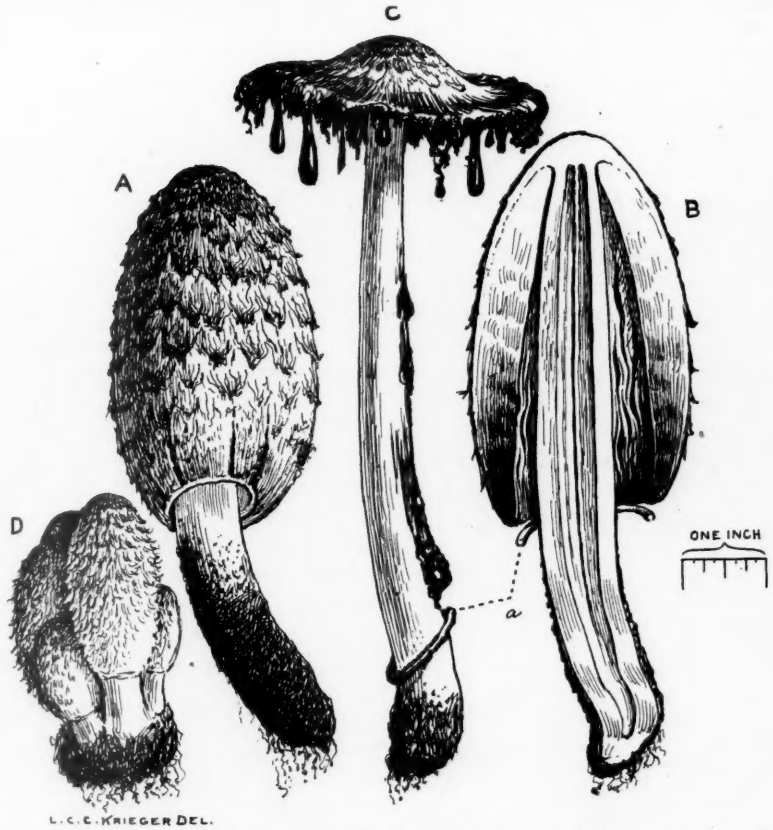


FIG. 11.—*Coprinus comatus*. Whole series, from extreme youth to the last stage of deliquescence. At (*a*) the volva, or so-called "ring." Note the "cord" suspended in the hollow of the stem in B.

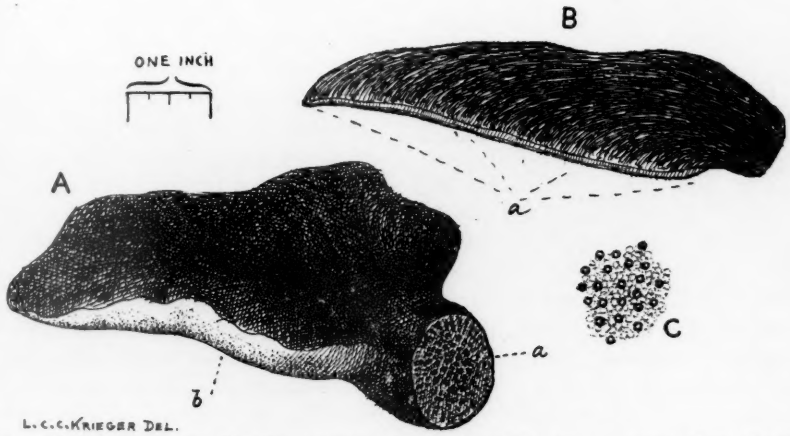


FIG. 12.—Beef-steak mushroom, *Fistulina hepatica*, about half natural size. A, mature plant, showing the "marbled" appearance at (*a*) due to the dark and light fibers which have been severed transversely. (*b*) Hymenium. B, section of a plant showing the fibrous structure within. (*a*) Hymenium. C, view of the hymenium under a hand-lens, showing the "papillæ."

Among the most interesting of all the mushrooms are the puffballs, or Devil's snuff-boxes, some of which open by an apical mouth (Lycoperdon among others) and discharge their spores in little puffing clouds, while others (Calvatias) break open on top in irregular fragments and so let their spores out into the air for distribution. The big white ones are all good to eat when firm and white inside and are easily recognizable from a simple illustration (see Fig. 13 of *Lycoperdon gemmatum;* Fig. 14, *Calvatia gigantea*). Let me here emphatically call attention to a danger of mistaking Amanitas in the button stage for young puffballs. Refer to the figure of *Amanita virosa* in the volva.

Last of all in this short list I speak of a Morel (*Morchella esculenta*), which is

FIG. 13.—Puffball, *Lycoperdon gemmatum*, natural size.

also figured (Fig. 15). This is the only species I have introduced belonging to another order of fungi, but it must not be left out as it is one of the very best of all the edible species; indeed, in some parts of the country when people speak of going out to gather mushrooms they mean this and no other form! A morel is an ascophore—that is to say, instead of its spores being formed on a basidium, four in number, they are formed in a sac, or ascus, an elongate cell containing the two to eight spores. The accompanying figure shows so well the striking characters of a morel that it needs no further description. The cap or pileus is globose or ovate, ribbed and deeply pitted; the surface is made up of anastomosing ribs, or plates. It is borne on a stem and grows on the ground, and is one of the most striking forms we have, in the vast diversity of forms in the midst of which Nature seems to disport herself, as she mocks our feeble minds as we seek to follow and comprehend. The interior of the stem and the cap are hollow, which permits the stuffing with meats, etc.

PREPARING MUSHROOMS FOR THE TABLE.

There is a wise injunction in the older cook-books to the effect that "You must first catch your hare and then cook it." Having secured our mushrooms for the table, and having carefully kept out of the basket any Amanitas, saffron-colored bunches of *Clitocybe illudens* and green-gilled Lepiota, we are prepared to visit the kitchen and instruct the cook how to prepare them for the table. Here, as in all cooking, everything depends upon the way the food is treated. One cook will take the raw materials and send to the table a delicious, appetizing meal, while another with precisely the same equipment will serve up a mess calculated to destroy a vigorous appetite. So with mushrooms, don't judge hastily, but be patient in testing out this important matter.

Let me utter an express warning against storing mushrooms for days like other vegetables, even though they are kept in the best place, a refrigerator. The sooner they are eaten after picking the better.

For cooking keep the mushrooms clean as they are collected. Reject all old and wormy and slug-infested specimens, or if only the stem is affected cut it off. Cook one kind at a time until you know them, and tell the table guests what species is before them; it adds to the interest, and promotes mycophagy. Until used keep them in a cool place and throw away any withered or yellow ones if they have been kept long. When ready to cook, wash (but

don't soak) them in a deep pan, rubbing gently, using a cloth if needed to wipe off soil or grit. Then drain them. Do not remove a clean skin, it adds to the tastiness. Thin, juicy specimens can be cooked in a little butter in about ten minutes; thicker, tougher specimens may require a half-hour or more with a little water added. The simplest methods of cooking are the best, as they preserve flavor; it is of no use to have a dish of mushrooms and then disguise the taste by smothering them in other ingredients, but it is always well to thicken the gravy with a little flour paste. Fairly large, well-opened caps can be broiled or baked; Lepiotas should always be treated in this way. In broiling place them in a double broiler gills down and broil a couple of minutes, then turn and broil a couple of minutes more and remove, and while hot season, butter well, and serve hot on toast. They are best baked in a heated, covered glass dish for about fifteen minutes along with toast and a little cream and butter and seasoning. They make a pretty dish served individually steaming hot, covered with a clear glass top.

The pretty Cantharellus, egg-yolk in color, is prepared by cutting off the stems, cutting the caps into fairly large pieces, and simmering slowly over a low fire; they lose in flavor if subjected to a high temperature. Cook with a little fresh butter and olive oil, pepper and salt, and a little lemon-peel. After simmering for some twenty minutes a little beef gravy may be added, or cream, and finally the whole may be thickened with the yolk of an egg.

FIG. 14.—Giant puffball, *Calvatia gigantea*.

In cooking Coprini Mrs. Rorer says they are all best put into a slow oven and covered to keep in the flavor. "Trim the stems, wash them carefully, and drain through a colander; spread in a long bak-

ing pan, and pepper and salt lightly, put in some pieces of butter, and cover with another pan and bake in moderate oven for twenty-five minutes. Then add several tablespoonfuls of cream, bring to a boil, dish on toast, and serve."

Fistulina hepatica is best prepared by cutting into slices, and frying slowly in butter, well seasoned. As it is sometimes acid, it may be immersed for about fifteen

FIG. 15.—Morel, *Morchella esculenta*, one-half natural size

minutes in a solution of baking soda in water, the water poured off, washed again, and then cooked.

Pleurotus ostreatus or *ulmarius* ought not to be soaked in water, nor yet allowed to dry out before cooking. Cut off the stems, and cut into smaller pieces and stew over a slow fire in a little water, adding cream or milk, with butter and seasoning.

To cook puffballs, slice them, in pieces about a third of an inch thick, using only clean, white-looking specimens. Stew twenty minutes over a slow fire, adding cream or milk, with thickening, and butter and salt and pepper; they can also be fried like oysters.

In the above I have consulted largely the work of Charles McIlvaine, the greatest mycophagist this country has produced.

There are many other ways of preparing them for the table, but these simpler methods are best for beginners; it is easy to enlarge later.

It is my confident expectation that we are destined to see in the near future a great development of our national interest in the subject of the edible fungi, and consequently in the whole subject of the classification and recognition of all our commoner and many beautiful species.

If I have succeeded in interesting my brethren of the Stethoscope and the Scalpel in these lowly but important "vegetables" (?) I shall be glad to pursue the matter further and into greater detail. It is really time that every good-sized city in the land had a mycological society and was a mycology center, like Boston and Toronto to-day.

FATALITY FOLLOWING SALVARSAN.

CHRISTIANSEN (*United States Naval Medical Bulletin*, Vol. XIII, No. 1, 1919) quotes other observers to the effect that intravenous injection of an arsenic salt is not without its danger, and that the more modern preparations are more toxic than the original. In the case reported the patient was given on January 28, 1918, 0.6 gramme of salvarsan at 10 A.M. Twelve of the patients received similar doses from the same package, nor have any of them had any reactions. At 1 A.M., the patient had a severe chill, suffered from air hunger, and was delirious; the same night coughed up dark bloody material; the next day had convulsions, and died that night. The autopsy showed a large chancre with indurated margins present on his glans penis. The aorta exhibited small areas of early atheromatous degeneration, the musculature showing numerous patches of fibrosis. There was an early central necrosis of the liver and an acute hemorrhagic interstitial nephritis. Death was attributed to the toxic action of the arsenic on a heart weakened by the valvular lesion and myocarditis. Both of these conditions were explained by the history of a previous gonococcic bacteremia.

EDITORIAL.

BOTTLE FEEDING VERSUS BREAST FEEDING.

It is quite true that there are some enthusiasts in the modification of cow's milk who are convinced that modified cow's milk affords a satisfactory substitute for breast feeding, and there are some amongst the laity who desire to be relieved of the responsibility of natural feeding who are inclined to join with them in this view. On the other hand, it is fortunate that the majority of the laity, and the majority of physicians, still believe that breast feeding has certain advantages under various conditions which cannot be equaled by any form of artificial feeding, not only because the breast milk usually suits the child better than any experimental combination, but also because in some instances it probably has the ability of transferring from the mother to her offispring certain immunizing substances which are advantageous.

For this reason we think that our readers will be interested in a paper by McClanahan of Omaha in the *Archives of Pediatrics* on "The Relative Morbidity of Breast- and Bottle-fed Infants." This writer recognizes that the number of cases which he has recorded is not sufficiently large to be of great statistical value, but they serve to emphasize his belief that the morbidity is greater in bottle-fed infants than in those that are breast-fed. His views are not dependent upon his own experience, but rest upon a large number of inquiries sent to physicians in active practice.

The questions advanced were designed to give him facts upon which he could base adequate conclusions. He believes that breast-fed children as a rule are better fed, in the sense of better nourished, and also that such an infant has relatively greater immunity to all of the general infections. This immunity is partly inherent and partly acquired. McClanahan admits that certain infections like tuberculosis, whooping-cough, and influenza are not strongly resisted by nursing infants, but he believes that even these diseases are better withstood by a breast-fed child than by one which is bottle-fed, and this is largely due not only to better nutrition, but to the presence of antibodies or protective ferments in the mother's milk. His belief is strengthened by the observations of Ehrlich as long ago as 1892, and he quotes Romer in 1909, as asserting that the agglutinins may be carried in the breast milk to the infant; so, too, Moro in 1902 found evidence in the blood of nursing infants that it contains bactericidal substances not found in cow's milk. Another advantage is that there is no possibility of the contamination of the human milk as it enters the infant's stomach sterile and fresh, a condition which comparatively speaking is impossible with cow's milk.

McClanahan therefore concludes that the morbidity amongst breast-fed children is much less than that amongst bottle-fed children, and that they resist infection more quickly and more adequately. While this resistance does not seem to hold in the case of influenza and tuberculosis, nevertheless unless the mother is tuberculous, feeding breast milk will help the child maintain its immunity better than if it takes cow's milk, which may after all contain the bacillus of bovine tuberculosis be the precautions what they may.

UNUSUAL METHODS OF TREATMENT.

Not infrequently the regular practitioner of medicine hesitates to introduce a novel method of treatment, particularly if it requires certain movements of the body which are unusual, either because he feels that certain manipulations and movements too closely resemble those practiced by charlatans, or else because he has a feeling that the patient will be averse to such procedures and expects relief by means of drugs.

In many instances without doubt this mental attitude is an error. It is quite true that some patients absolutely refuse, or

laugh at, remedial measures other than drugs, but it is quite remarkable how often they not only willingly but gleefully take up methods of training their muscles or other organs, and if they do not persist it is rather because they tire of them and not because they think ill of them.

We are led to these remarks because there there can be no question that osteopaths, chiropaths, neuropaths, and a host of other so-called practitioners less well known, get a large number of patients by these various means.

Our attention has been called to the matter too by a communication in the *New York Medical Journal* which bears the very unusual title "Rolls Before Breakfast," which naturally would lead one to believe that the patient was supposed to eat a roll while dressing. Investigation of the paper, however, shows that Dr. Brady is an enthusiastic supporter of no less an extraordinary method of treatment than prescribing for patients that they shall every morning before breakfast perform a certain number of somersaults, and he states that after a little practice one can do this on a hard surface without difficulty, and, therefore, it does not require a mattress on the floor. Indeed in many instances he thinks that six somersaults should be taken every night and every morning, and particularly recommends this treatment in the menstrual difficulties of young women, in poor circulation of men and women, and claims that by this means a large amount of blood is driven out and replaced in the abdominal area. He also finds the plan useful in simple constipation and intestinal stasis due to ptosis and flatulence, in stout patients who eat too fast or too much, and in those who suffer from mental depression apparently dependent upon hepatic inactivity. Dr. Brady admits that persons of middle age, or older, require some assistance when they first begin this practice, but he claims that if they persevere they will overcome all obstacles in a reasonable time; and for the unusually clumsy or timid people it will be a help to have some youngster demonstrate how easy the somersault is.

The somersault must be so complete that the patient comes up on his feet after each turn. Dr. Brady says "try it on some of the chronics that haunt you. If it does no good it will do no harm, and in any case it is not unpleasant medicine to take." What fat men and women will think of this last statement we believe we know. We mention Dr. Brady's communication not because we are quite ready as yet to accept his statements in full, but because what he has written offers a theme upon which the subject of remedial measures other than drugs can be dwelt upon.

THE USE OF WHOLE BLOOD OR CITRATED BLOOD FOR TRANSFUSION.

The readers of the THERAPEUTIC GAZETTE will remember that from time to time we have called attention to the work done by advocates of these two methods of transfusing blood. There can be no doubt that in some respects the technique of the citrated method is simpler and less difficult than that of direct transfusion, or indeed of indirect transfusion by means of the use of syringes as practiced by Lindeman.

It will be recalled that the citrate method consists in employing a large cannula, from which the blood can flow freely when it is introduced into a vein of sufficient caliber to give a good supply; that the blood should be received in a vessel kept at body temperature, and that as it flows into this vessel it shall be gently, but thoroughly, stirred with the citrate solution to prevent coagulation. Roughly stirring it may possibly damage the corpuscles. It goes without saying that the water in which the chemically pure sodium citrate is dissolved should be freshly distilled.

The quantity of citrate employed is usually about 50 Cc. of a 2.5 solution if as much as 450 Cc. of blood are employed. Those who are particularly anxious to avoid the entrance of a clot filter this mixture of blood and solution through several layers of gauze before it enters the apparatus which is connected with the rubber tube and

needle, the latter entering the vein of the donee.

It is remarkable how many hundred infusions of this kind have been performed without any evil results. Indeed, it may be said that the advantages which accrue are governed solely by the underlying condition of the patient. In cases of profound anemia due to acute loss of blood, naturally the best results ensue, and this holds true also in cases in which there is persistent oozing hemorrhage. In theory at least pure blood transfusion to aid in increasing coagulability of the blood should give better results.

When it comes to the employment of blood transfusion in cases of pernicious anemia and leukemia, the proposition is of course entirely different. Here we have disease of the blood-making organs and pathological changes in many other organs of the body, including the heart and vascular system in general. In cases of anemia from loss of blood the result is usually manifested with remarkable promptness and the improvement is permanent. In other cases, as, for example, pernicious anemia, it is at best only temporary.

It has also been suggested by some that these injections should be used in cases of bacteremia, diabetic coma, and coal-gas poisoning.

While the quantities which are commonly employed amount to about 500 Cc., nevertheless as much as 1000 Cc. can be given at a time.

It matters little whether citrated blood or pure blood is used when it comes to the question of compatibility between the blood of the donor and the blood of the donee. Various methods have been employed to determine this relationship. Nearly all of them require the use of the microscope, but in an article by Garbat of the Medical Corps of the United States Army he tells us that he employs a macroscopic method in which 0.15 Cc. of serum from the patient is mixed in a small test-tube with 0.05 Cc. of a 10-per-cent red blood cell salt solution from the donor. The mixture is incubated for three hours, placed in an ice-box for twenty-four hours, and then read to see whether agglutination has occurred. If the result macroscopically is not clear, the mixture can be examined microscopically. Manifestly this macroscopic method possesses the disadvantage of losing twenty-seven hours, a loss which is not suffered when the microscopic methods are employed. In very urgent cases it would seem proper to transfuse at once and to take the risk of incompatibility between the donor and the donee.

A final word must be said in regard to the frequency with which reactions follow the use of citrated blood. This point is also dealt with by Garbat, and he admits that such reactions are by no means unusual, for out of 100 transfusions 42 showed a definite reaction, consisting in chilly sensations and chills followed by fever, and in the severe types by vomiting. The temperature rose sometimes to 103° or 105.° In 10 per cent he says there was practically no reaction, although there was a rise of temperature of one or two degrees for several hours, and in 48 per cent there were no abnormal manifestations either subjectively or objectively.

THE PREVENTION OF VENEREAL DISEASE.

It is recorded by Harrison (*The Practitioner,* March, 1919) that the vicar of a parish in which one of the British V. D. hospitals is situated confessed soon after it was established there that his congregation had threatened to forsake him if he called on the officer staff. In another place where it was proposed to establish a venereal hospital which had lately been vacated by troops, the local editor besought the authorities to remember the boys' schools in the neighborhood and the danger of contaminating an important water-supply with the germs of this terrible disease. These are examples of the popular ignorance regarding venereal diseases which those who have studied them are slow to realize, and which must be dispelled as a part if not the very beginning of an efficient antivenereal campaign.

Of the two venereal diseases which affect

perhaps broadly 10 per cent of the population of any civilized country and produce a degree of morbidity and mortality greater than, for instance, that which follows tuberculosis, syphilis contributes about 25 per cent, gonorrhea 75 per cent. Syphilis can be rendered non-contagious within twenty-four hours, can be symptomatically cured in a few days; its manifestations are readily controlled, and there is at least hope, if as yet unproved, that it can be permanently cured.

Gonorrhea, on the contrary, if once developed, requires weeks or months to cure, and though in the vast majority of cases, either with or without treatment, it gets well, there is a small percentage which cannot be cured. Moreover, there is no way by which during these weeks or months of treatment the infected person may be made safe against transmission to another by sexual contact, nor during these weeks or months are the effects of the disease such as to prevent, on the part of those of low morality and given to self-indulgence, further sexual contact. Indeed, the urethral and periurethral infection is often a strong excitant of libidinous desire. In any event there can be no successful campaign against either syphilis or gonorrhea which is not based on means taken to prevent carrying the contagion by those infected.

An important measure which would seem most rational would be the immediate application to a person exposed to infection of a medicament having the power to destroy such germs of the disease as lie upon the surface without injuring the tissues upon which they are placed. If the germs have once penetrated underneath the surface their destruction is impossible without unjustifiable traumatism; even then uncertain. Hence the time element is of major importance.

That part of the campaign devoted to the prevention of exposure and expressed by the word continence is of distinct value. There is no reason to suppose that with a larger education it would do more than lessen perhaps to an appreciable degree the incidence of these diseases. Various measures bearing upon the segregation and examination of prostitutes have been given as thorough a trial as human frailty permits, at various times and in various countries, and with local exceptions have proven of little service, except when these local exceptions were such as to allow a strict supervisional control of both men and women —*i.e.*, were in places comparatively limited in population and in which all were under military control.

Harrison believes that the safest plan in dealing with professional prostitutes is to act on the assumption that all are diseased and to teach them how to prevent carrying infection to the men. Where this has been done the proportion of infection to intercourse with the women concerned has been less than 0.15 per cent, which compares favorably with the rate 2 per cent to 7 per cent following exposure without precaution. He urges that an efficient campaign against venereal diseases must be based on the breaking of the chain at the male end.

Probably half of the sexual intercourses of men out of wedlock are with diseased women, yet the highest percentage of infections has been put at 7.4 per cent. Allowing a risk of 7.4 per cent, which is high, the risk of infection from intercourse with the diseased women is heavily against its occurrence. The natural agencies operate strongly against the gonococcus and the spirochete when they are planted on or in the male genitals. They are planted in an exposed situation, easily removed by urination or ordinary ablutions, and when natural agencies are assisted by the prompt application of antiseptics, the chances of infection can be reduced to an infinitesimal degree.

The chances of infection for a healthy woman consorting with a diseased man are, providing she takes no measure against the infection, largely in favor of her becoming diseased, conditions always being such as to favor the rapid growth of pathogenic germs.

Harrison quotes Colonel Walker to the effect that of 2426 exposures to venereal infection dealt with by disinfection within an

hour and a quarter of exposure, there were only two infections. In one group in which the men neglected to undergo subsequent disinfection the venereal rate was 720 per thousand per annum. Compulsory disinfection was introduced, and every man who went out on pass was disinfected on return whatever he might say about exposure while out. In this group with 3600 men the infections were reduced at once to 10 per 1000 per annum. The disinfection applied was thorough washing by soap and water, washing by perchloride of mercury solution, injections of the urethra of 2-per-cent protargol or 10-per-cent argyrol, which must be retained for three minutes; thereafter inunction of the parts with 30-per-cent calomel ointment and wrapping of the penis in toilet paper, which is kept on for four hours.

Riggs is quoted to the effect that out of 5103 men who exposed themselves to infection, 1180 were treated within an hour and only one lesion resulted. This was not a venereal infection. As the period between exposure and disinfection was increased, the percentage of infections rose. The jump after four hours was particularly noticeable. Young reports of the American army in France that in one battalion where all-night passes were used the venereal rate was three times as high as in the neighboring battalion where men were required to be back by night. In the British army the men on application to the medical officer or his orderly are given the means for disinfection after illicit intercourse. The means are a small bottle of 1-to-1000 permanganate of potassium with which to swab the parts; a small piece of cotton-wool for use with the permanganate; a small tin tube containing calomel cream in two consistencies. The first portion to ooze out when a pin is pushed through the nozzle of the tin capsule is semifluid and intended for injection into the urethra; the second portion is more solid and intended for inunction of the parts. The strength of the calomel in both is the same—30 per cent.

Recently 2.5-per-cent thymol has been incorporated in the cream, because laboratory experiments appear to confirm the statement that thymol makes the ointment more bactericidal. The ideal method is that in which the man submits himself to treatment by a skilled attendant within an hour of exposure. But promptitude is vitally necessary to success; if he cannot obtain skilled assistance, he should have the means of self-disinfection with him.

Harrison observes that it has been shown by numerous workers that if a man will apply for treatment on the very first day of the attack of gonorrhea the disease can be aborted in 95 per cent of cases in ten days or less. The means adopted consist in the injection into the urethra of solutions of such organic salts as argyrol, silver nucleinate, or protosil for a few days in succession. The Australian Medical Service has in this way saved many thousands of admissions to hospitals. It seems clear that when men have delayed disinfection for a number of hours after exposure the best plan is to treat them by the abortive method —that is, to repeat the injections into the urethra for a few days in succession.

Marshall takes up the question of legislative measures in the campaign against venereal disease and is not highly enthusiastic over notification, or what we call reporting, for reasons sufficiently obvious to those who have given the matter even casual study. He likewise rejects regulation of prostitution as troublesome and inadequate. Concerning the medical or practical measures, he urges increased facilities for diagnosis and treatment, including better instruction of the medical profession in venereal diseases, the early abortive treatment, and personal prophylaxis. Both the Army Council and the National Council for combating venereal diseases regard it as right to carry out measures to abort a possible infection after the event, but wrong to carry out measures to prevent such infection before the event.

In 1906 Metchnikoff and Roux, after their failure to obtain an attenuated virus for prophylactic inoculation against syphilis, tried the preventive effect of 33 per cent of calomel in lanolin. This ointment when

rubbed into the point of inoculation of the syphilitic virus in a macacus monkey an hour after inoculation prevented the development of the chancre, while another monkey inoculated with the same virus developed a chancre in due course. The experiment was repeated upon a heroic medical student. No chancre or secondary symptoms followed. The ointment was found to be ineffective twenty hours after inoculation. These experiments when repeated by others did not always prove successful in preventing the development of chancre. None the less Metchnikoff's ointment became the recognized prophylactic measure against syphilis. Prophylaxis being most efficient when applied immediately, men have been given prophylactic medicaments in collapsible tubes when going on leave with directions for use. It must be conceded that there is no measure suggested or adopted in the campaign against venereal disease which is infallible. That measure which offers the greatest prospect of success and which in many instances has given encouraging results is that of personal prophylaxis.

A NEW TREATMENT OF INJURED AND INFECTED JOINTS.

One of the doctrines upon which surgical practice has been founded and one of almost universal acceptance is that an injured or inflamed part, if the injury be severe or the inflammation acute, is best treated by rest; and the more absolute and complete this rest the more it assures desired results.

Although it has been recognized that all healing depends upon circulation of blood in its vessels and that rest of the part implies the rapidity of circulation reduced to its lowest limits, none the less the obvious disadvantage of motion, even aside from the pain implied, has apparently been so well proven that few dissenting voices have been raised against the application of this doctrine. It is true that Championnière years ago vividly inveighed against absolute fixation as a means of treating fracture, holding that the bone would mend more quickly, and the stiffness of joints, sometimes permanent after prolonged rest, would be prevented, if motion were inaugurated from the first. Perhaps one of the most astonishing contributions to surgery, if it be justified by further trial, is that made by Willems concerning the treatment which in his hands has yielded truly extraordinary results in wounds of joints. Bainbridge (*International Journal of Surgery,* March, 1919) records his technique in full, having visited his hospitals at Hoogstade and Bourbourg and found that, far from overstating the facts, he would have been warranted in making even greater claims. Bainbridge states that in dealing with joint lesions of all kinds, immobilization has been the method of treatment invariably followed. It has, however, given such poor functional results that, even before the war began, tentative efforts were made to devise some treatment which would be more successful in preserving the function of the joint. Willems was one of the first to abandon this principle of immobilization, and his work bids fair to revolutionize the old ideas on the subject. Since the war began he has had the opportunity of studying a large number of cases and perfecting his method of treatment, which is based on the principle of immediate active mobilization of the joint. He points out that in order to obtain the best results certain general rules must be observed.

The motions must be carried out by the patient himself; they must involve those muscles ordinarily used in moving the joint; they must be begun the moment the patient comes out of the anesthetic; they must be carried out to the point of their maximum excursions; and they must be as nearly as possible continuous. They should not be supplanted by or combined with passive motion.

These movements cause practically no pain unless they produce displacement of a large fragment of bone, in which case such movements are contraindicated.

This method calls for the constant supervision of a trained attendant, and its success depends to a large extent on the courage

and good-will of the patient, as well as on his power of coördination.

The details of the treatment vary considerably according to the nature, extent, and location of the injury.

A simple traumatic hemarthrosis or hydrarthrosis is treated by aspiration and immediate active motion, the patient being instructed to walk if the knee is involved or to flex and extend the forearm if the elbow is involved.

Wounds by projectiles call for a resection of the edges of the wound, a uni- or bilateral arthrotomy (always using a vertical incision), removal of the projectile and any other foreign bodies, cleansing of the wound with ether, closure without drainage, and institution of active motion as above described.

When the larger part of the articular surface is intact, and when there is no detached or easily detachable fragment of bone, the treatment is exactly as in the preceding cases, plus the removal of any splinters of bone. The cases in this class which give the poorest results are those in which there is more or less extensive injury to the articular cartilages.

Another class of cases includes those in which an important fragment of bone is detached or easily detachable, thus changing the articular surface and affecting the statics of the joint. If the wound is in one of the arm joints, especially the elbow, the case can be treated as if no fracture existed. The constant motion of the joint prevents the formation of any intra-articular exostosis, and the functional result is good. If the wound is in the knee, certain precautions must be taken. Active flexion and extension must be begun immediately, but the patient cannot begin to walk until the bones have knit sufficiently so that there can be no danger of displacement. This requires about three weeks, after which the treatment is as usual.

A third class of joint wounds includes those with considerable injury to the bony tissue. These may be subdivided into the following groups of cases: those involving an extensive loss of substance of one or both epiphyses; those involving the fragmentation of one or of both epiphyses.

In the first group, part of one side of the epiphysis has been destroyed; the corresponding part of the other epiphysis has lost its point of contact and the statics of the joint have been disorganized. In the elbow this is not of much importance, since this joint does not have to support much pressure. The patient will make active flexion and extension as quickly, completely, and easily as with a lesser injury. There will be some lateral deformity and at most some lateral mobility which tends to improve or disappear, but the functional result is generally good.

When the knee is affected, the usual treatment should be followed while the patient is in bed. When he starts to walk he is at first unable to bear his weight on the affected knee and should be given a jointed Thomas splint. After several days of walking with this apparatus the patient will be able to walk, using only a cane for support. A certain lateral mobility will persist, tending sometimes to improve or disappear, though in certain cases the patient will have to wear a jointed leather support for the knee before he can walk without a cane. The improvement or disappearance of the lateral mobility is brought about partly by a contraction of the muscles on the opposite side to the lesion and probably partly also by the contraction of the ligamentous capsule on the healthy side.

If the destruction of tissue has been too great, resection will have to be done, but Willems states that if not more than one whole condyle or half of the articular surface of the tibia has disappeared conservative treatment should still be tried, resecting the joint later if the result is not satisfactory.

When there is extensive loss of substance of both epiphyses, conservative treatment should be tried if, in the knee, the crucial ligaments are still intact and if more than half of the articular surface is preserved. Resection can be resorted to later if necessary. Patients with wounds of this sort can begin to walk as soon as the wound is

cicatrized or well granulated, using at first the apparatus as above described.

When there is extensive fragmentation of one or more epiphyses, the treatment must be somewhat modified, inasmuch as the fracture is accompanied by marked displacement.

In this class of cases it is convenient to consider separately injury to the knee and to the elbow, and injuries involving one or both of the epiphyses. Wounds of the knee-joint involving only one epiphysis call for a careful removal of all fragments which manifestly cannot be saved, and the application of an extension apparatus fastened by screws above the malleoli. This apparatus, with screws, chains, and foot tractor, is made by Collins in Paris. Active flexion and extension should be begun immediately. This is at first difficult and limited in its action, but may be facilitated by a momentary relaxation of the extension. The length of treatment necessary and the functional result will depend upon the possible infection of the wound and upon the extent of the injury. If one epiphysis is entirely gone, there will of course be shortening and almost complete loss of functtion. If, however, the larger part of the articular surface on one side is intact, the extension will bring the fragments into place and keep them there, and the functional result will usually be good. Wounds involving the tibia are much more apt to become infected than those involving the femur.

When both epiphyses have been shattered into numerous fragments, conservation can still be tried if a sufficient number of them remain adherent and fall into position, after the extension apparatus has been applied. If the treatment succeeds, the joint will be ankylosed, but not shortened. If callus does not form properly, or if it is manifest in the first place that conservative treatment will not succeed, resection or, if necessary, amputation may be performed. If, on the other hand, the damage is less extensive, and if after extension part of the articular surfaces of the two epiphyses on one side can be preserved, the fracture may consolidate and there may even be some mobility of the joint. Of course if the popliteal vessels are injured, amputation will have to be resorted to immediately.

When the elbow is involved, conservative treatment should be tried so long as any part of the articular surface of the two epiphyses or even of one epiphysis alone can be preserved. After cleansing the wound in the usual manner, the splinters of bone should be removed, the wound closed if possible, and active flexion and extension immediately begun. Remarkable results can often be obtained with a minimum amount of articular surface.

It is, however, in the treatment of purulent arthritis that the most surprising results can be obtained by immediate active mobilization.

It is exceedingly difficult to secure the proper drainage in these cases by arthrotomy, and resection has been, ordinarily, the operation of choice. Willems's method has the immense advantage of preserving in almost all cases the function of the joint, as well as of simplifying the treatment. He advises a uni- or bilateral arthrotomy followed by immediate active motion of the joint, even instructing the patient to walk after the temperature has fallen below 100° F. and while the joint still has a large opening. So far from being painful, the motions relieve the pain by emptying out the secretions and relieving the distention of the joint. Pus is expelled with each contraction of the muscles, and if the movements are repeated often enough and vigorously enough, the secretions are disposed of as rapidly as they are formed and complete drainage is assured. This treatment should not be supplemented by irrigation, which is, to say the least, useless.

As soon as the treatment is begun, the general condition of the patient improves very rapidly, and the temperature loses its septic character, falling to at least 100° F., although it may not reach normal for some weeks.

Locally the suppuration follows the course of an ordinary abscess, though somewhat prolonged. The swelling around the joint diminishes, but does not quite disap-

pear until the wound has healed. Periarticular abscesses are practically unknown. The secretion is abundant at first, but gradually decreases and finally disappears completely.

The motions of flexion and extension are easily made at first, but as the secretion begins to dry up there is a slight tendency to stiffening of the joint. To avoid this danger it is wise to close the arthrotomy wounds partially, as soon as the secretion has become considerably less. It will usually be found that the wound has become canalized along a certain path where the pus is discharged, and this is the only sinus which it is necessary to keep open.

Other things being equal, the drainage will be better in those joints in which the movements are more extensive. Thus the elbow and the knee respond best to this treatment, whereas the wrist and the ankle, in which the movements are more limited and the secretion consequently less easily expelled, will respond less quickly.

The function of the joint will almost invariably be preserved to a large extent, if not completely, and it is not unusual to see a perfect result, especially in the elbow. There is, moreover, practically no atrophy of the muscles.

The success of the method seems to be due to the complete drainage which limits the infection to the synovial membrane and prevents it from spreading to the cartilage or bone.

Willems gives the following statistics with regard to 100 consecutive knee cases: Eighteen of these were accompanied by a purulent synovitis of a virulent type, chiefly streptococcus, but in the 100 cases there were no deaths and no amputations. There was one resection in a case in which the crucial ligaments were gone and the popliteal artery was thrombosed, and there were two stiff joints, one of which it was hardly fair to count, since the patient had failed to follow directions.

If Willems is right, and a complete study of these cases on the part of an honest but skeptical observer proves that his results are not colored by that enthusiasm which so often leads to misinterpretation, he has introduced a technique which every surgeon will, with rational modifications suited to individual cases, be compelled to follow. Until such conclusive proof it would seem wise to proceed cautiously with a method which theoretically is impossible of application and assures unfortunate results.

REPORTS ON THERAPEUTIC PROGRESS.

TREATMENT OF INFLUENZAL PNEUMONIA BY THE USE OF CONVALESCENT HUMAN SERUM.

McGUIRE and REDDEN, in the *Journal of the American Medical Association* of March 8, 1919, state that influenza patients who have a continuous high temperature persisting over three days, or who have a secondary rise of temperature immediately following influenza, should be regarded as probably developing influenzal pneumonia. Signs of consolidation may not be present at this time, but patches of fine râles can usually be found. These signs, taken in conjunction with a persistent low white blood count and in the absence of other complications, almost invariably mean a beginning influenzal pneumonia. This is the most favorable time to start serum therapy. If serum is given at this early stage of pneumonia, favorable reaction is universal. If one depends on a rising pulse and respiration, as well as on the high temperature, he will frequently allow a patient to pass beyond the time most favorable for any kind of serum therapy.

Out of 151 patients with bronchopneumonia following influenza treated by human convalescent serum, three have died without complications, and three have died after a complicating hemolytic streptococcus empyema, making a total of six deaths, or 4 per cent.

Most of the cases were treated early in the pneumonia complication, and hence were well suited for serum treatment.

Out of 151 patients, 132 received three doses of serum or less; about two-thirds required only two doses, and over one-third but one injection. Those who received more than one injection for the most part had advanced to at least two days in their pneumonia. The average dose used here is 120 Cc.

Out of the 138 patients, 83 recovered by crisis, and 55 by lysis.

In 148 cases, over half showed a normal temperature within forty-eight hours after the beginning of serum treatment.

The febrile period of the disease was decidedly shortened, though the lung signs persisted.

Several cases without definite signs were treated with serum. These are not included in the group reported. In some of these cases it would seem that possibly a pneumonia was prevented.

Incomplete experiments with pooled "normal" serum and with pooled serum from uncomplicated influenza patients indicate a lack of curative power in such serums. Pooled serum from patients treated with immune serum seems to have about the same potency as that from the earlier untreated cases.

Over half the cases treated were received during the recent recrudescence of the epidemic, when there has been no doubt about the severity of the pneumonia complication. Complications have been infrequent.

There has been no increase in chills since the compatibility tests were discontinued. They have never seen urticaria or any other signs of serum sickness after the use of human serum.

Bronchopneumonia with a white blood count below 10,000 or 12,000 is most favorable for treatment with this serum, though a number of patients with much higher counts responded readily.

They conclude that pooled serum from convalescent influenzal bronchopneumonia patients has greatly reduced mortality, has shortened the course of the disease, and has proved almost a specific, not only during a waning epidemic but also during the more recent severe recrudescence.

TREATMENT OF MENORRHAGIA WITH RADIUM.

In *Minnesota Medicine* for March, 1919, STACY states that the technique used by him is similar to that in use elsewhere. The patient is given a cleansing douche, the cervix is drawn down by a tenaculum forceps, swabbed with tincture of iodine and gently dilated, and the radium is inserted into the uterine canal. The radium element is encased in a glass tube within a silver tube 0.5 mm. thick, and this in turn is enclosed in a rubber tube 0.5 mm. in thickness. This screening is sufficient to filter out the alpha and the soft beta rays which produce the local irritation. A narrow strip of plain gauze is carried into the cervix and the vagina is packed.

The patient is allowed to leave the hospital a few hours after the radium is removed. She keeps off her feet for the following twenty-four hours. If there has been a recent hemorrhage, or if the treatment is given during the menstrual flow, the patient remains in bed until the flow ceases. Usually the flow at the first period after the treatment is as profuse as usual, or it may be increased in amount. The reason for this is not definitely known. It may be because of the local hyperemia of the endometrium, produced by the beta rays, or it may be due to the liberation of the ovarian hormone by the destruction of the corpora lutea.

In the majority of patients more than forty-five years of age, and in all in which there is intermenstrual bleeding, a diagnostic curettement is done previous to the radium treatment. If the clinical history is at all suggestive of a carcinoma of the fundus, a hysterectomy is done, for even a very thorough curettement may fail to relieve a carcinomatous focus.

The dosage of radium is gauged by the age of the patient, and by the presence or absence of a tumor. In the young person without a demonstrable tumor, and when it is desirable to continue menstruation, usually one application of 50 mg. of radium element for from four to six hours (200 to 300 mg. hours radium) is used. In older

persons in whom it is desirable entirely to stop menstruation, it has been found that an exposure of 50 mg. for from ten to twelve hours has brought about the desired results. In cases in which large dosage is used, menstruation is usually irregular for about two months and ceases entirely after the second or third month; following the lighter exposures it becomes regular and normal in most instances in about two months. It is Stacy's custom not to repeat the treatment until an interval of three months has elapsed. If, after that time, menorrhagia continues, a second treatment is given, and with the exception of one case, the second treatment has been effective. In this instance menstruation ceased for one year, and then became profuse and the period prolonged. It has been necessary to give a second treatment in ten instances in this series. In eight instances a hysterectomy was done later; one elsewhere one month after the radium treatment. One only of these eight patients had been given a second radium treatment.

Included in this series is one case of adenomyoma of the uterus, in which a microscopic diagnosis was made at the time of the exploratory incision. There were one intra-uterine treatment and four abdominal treatments with entire disappearance of the tumor, which at the time of the exploration was the size of a grapefruit and adherent to the pelvis. At the last examination the uterus was the size of the thumb.

Reports have been received from 143 of the 175 patients, and in 55 (38.5 per cent) menstruation had ceased, not to return to the date of the report; in only 14 did the menstruation cease immediately following the treatment. In 15 menstruation ceased for three months and returned; in 29 (20.2 per cent) the menstruation became normal; in 42 it was reported as regular but somewhat profuse, and in 30 (20.9 per cent) it became profuse. Ninety-two patients report their condition as improved, and 27 as not improved. Two died, and in one of these cases the physician reported that the death was clinically due to carcinoma present before treatment. There had been a negative curettement. The second died of pulmonary tuberculosis which existed at the time of the treatment.

In concluding Stacy says that radium is the treatment of choice in

1. Cases of menorrhagia of the menopause not associated with large fibroid tumors, and in which the possibility of carcinoma is definitely eliminated.

2. Cases of menorrhagia in patients between the ages of twenty-five and forty years, who have small submucous fibroid tumors, or who have no demonstrable lesions.

3. Cases of myoma in which there is a definite contraindication to operation.

4. Cases of menorrhagia in young persons who have resisted all medical treatment, in which very small dosage should be given.

THE TREATMENT OF INTESTINAL STASIS.

SADLER, in the *Illinois Medical Journal* for February, 1919, states it is probably needless to say that all cases of intestinal toxemia should have as a part of their general treatment thoroughgoing eliminative measures, such as the sweating procedures of the electric light bath or some other equally efficient treatment. The basic methods of general application to most phases of chronic constipation and its associated toxemia are those which we have long employed as the foundation procedures in the management of these troublesome conditions, and are as follows:

1. Dietetics. Give abundance of liquids. One glass of cold water is taken immediately on rising each morning. See that the patient takes at least eight glasses of liquids during each day. Use bran bread or bran systematically, together with the free employment of other forms of relatively indigestible cellulose, such as wheat flakes, asparagus, cauliflower, spinach, sweet potatoes, green corn and popcorn, Graham flour preparations and oatmeal foods, whole wheat preparations, bran bread, apples,

blackberries, cherries, cranberries, melons, oranges, peaches, pineapples, plums, whortleberries, raw cabbage, celery, greens, lettuce, onions, parsnips, turnips, lima-beans, and peanuts.

These coarse vegetable foods, of course, cannot be freely employed in those cases of stasis which are accompanied by alternating attacks of colitis.

Meals must be taken regularly. Food is a physiologic laxative and a stimulus to peristalsis. About the same amount of food should be taken at each meal in order to establish intestinal rhythm. Eat at the usual time—even if only fruit or bran is taken.

2. Mineral oil and paraffin. Sadler has discarded all forms of laxatives and cathartics—except in the early days of a course of treatment, when he sometimes uses cascara. Mineral oil is not a laxative—it is simply a lubricant and agrees with nineteen patients out of twenty.

These paraffin substances used either in liquid or solid form (and there's very little choice between any of these preparations from the standpoint of efficiency), given before meals in doses anywhere from one to four tablespoonfuls, are invaluable aids in combating intestinal stasis.

3. The moist abdominal bandage (Neptune's girdle) should be used in many cases. The patient must be instructed how to put it on and take it off. The linen girdle next to the skin is wrung out of ice water and applied snugly about the belly at bedtime and covered with mackintosh or other impervious material; cover both these with two layers of flannel, which are snugly pinned on. Unless the patient is undergoing treatment in midwinter, Sadler quite generally adopts this procedure and has the patient continue it for three to six months. It should be added that the linen cloth which goes next to the skin must be thoroughly cleansed by boiling at least twice a week or oftener to avoid skin eruptions—the "humors" of the old-time empirics.

4. Regular habits of stool. Train the patient to go at least twice a day to evacuate the bowels, with the feet elevated on a high footstool, so as to get the squatting position of former generations. Sadler has about reached the conclusion that any one whose bowels do not move oftener than once a day is suffering from mild intestinal stasis. A study of his patients, as well as the animals in the zoological garden, confirmed him in this belief, that there should be a bowel movement corresponding with every meal eaten.

Eating starts up intestinal peristalsis, and so it is a good practice to go to stool immediately after each meal.

5. Massage and electricity. Scientific massage and manual Swedish movements are invaluable in overcoming colonic stasis. The only form of electricity he has employed in recent years is the sinusoidal current. He regards other forms of electricity of very little value. A valuable method of employing electricity is to fill the rectum and lower colon with water, insert one pole and apply the other pole to the abdomen by means of a generous electrode. He employs the sinusoidal current in this way with great benefit.

6. Hydrotherapy and phototherapy. It would require a paper much longer than this to go into the details and to show the nervous mechanism involved in the results that are obtained by the use of hot and cold to the abdomen, arc light to the spine, etc. Hydrotherapy Sadler regards as one of the most highly efficient procedures to be employed in combating autointoxication, both locally and constitutionally. The use of hydrotherapy must be adapted to the individual case, but it is almost the sheet-anchor when it comes to getting those early results which are so essential to the patient's encouragement. Many cases are wonderfully helped by hot and cold (fomentations and ice) applied to the lower spine—five or six changes—beginning with hot, ending with the cold.

7. Exercise. Leg and trunk exercises tend to strengthen the abdominal muscles, together with the proper amount of walking each day. These exercises should be a part of the regular routine managements of chronic constipation. Both active and

passive exercises may be employed—according to the patient's strength and the nature of the case. Horseback riding and deep breathing exercises are of great value. During the past ten years he has worked out a systematic course of exercises—too elaborate to undertake to describe in a brief paper—but the following procedures constitute the foundation of the exercise régime, which must, of course, be properly adapted to each patient's individual condition and needs.

Whatever the treatment of constipation, it must be *daily;* irregular and desultory methods will not produce results.

A. Exercise in the standing position:

1. Deep breathing. With hands on hips, forcibly extend the abdomen as you breathe in through the nostrils. Whistle the breath out through the mouth, and before you breathe again lift the chest high.

2. Auto-massage. Press in the abdomen near the right hip bone, and with the abdominal muscles taut throw the hands upward. Press three times over each surface and work upward over to left and down to left hip bone.

3. Leg raising. Stretch legs downward and slowly raise and lower—take alternately and together.

4. Trunk raising. With hands on hips come up to sitting position and go back to lying.

5. Chest raising. Turn face down and lift the chest—hands remaining on hips.

B. Exercise in the sitting position:

6. Trunk circumduction. Hands on hips, eyes straight ahead and feet separated. Make a complete circle of the trunk from right to left six times, and reverse.

7. Liver squeezer. Take position No. 6 with hands on chest. Twist body to left and bend to right. The right elbow should glide past the right knee. Reverse.

These exercises are a part of the home treatment of stasis in which the patient must be thoroughly instructed, as much depends on their faithful and intelligent coöperation in these important details.

8. Mechanical Swedish movements and vibration:

These mechanical movements are all more or less valuable; especially have we had good service from the abdominal kneader, mechanical horse, and the tissue oscillator. The so-called roller reducer has proven of very little value in these cases.

Mechanical vibration must be managed by an expert to be of service in helping chronic constipation. Sadler is of the opinion that the indiscriminate use of the vibrator, whether on the part of the physician or layman, has done more harm than good. He regards this method of treatment as the least valuable of all the different methods of treatment tried during a careful study of this subject for the past dozen years. To-day, the vibrator with him is practically limited to use in connection with the dilatation of the rectal sphincter, which can be thus effectively carried out without the use of an anesthetic.

PRELIMINARY REPORT ON THE USE OF VEGETABLE MILK IN CHILDREN.

CHAPIN, in the *Archives of Pediatrics* for January, 1919, states that attention has been frequently drawn to the high nutritive value of various nuts. But nuts eaten as such are not an easily digestible food, mainly on account of their consistency, which with faulty mastication renders them mechanically highly irritating to the small intestines and colon. Even on proper mastication nuts are not easily borne by the intestinal tract of children, or, when in catarrhal state, in adults. But in the form of an emulsion the extract of nuts becomes, mechanically at least, very easily digested. Among the various nuts the almonds have received particular attention. Occasional references are to be found in American and foreign medical literature. Chapin's attention was drawn to the so-called almond milk by Kast, who has used it on his adult patients for several years. His experiences are shortly to be published, with complete laboratory reports.

According to the chemical analysis, the composition of the almonds, on an aver-

age, is as follows: Fat, 54.9; protein, 21.0; carbohydrates, 17.3; ash, 2.0; water, 4.8. The milk prepared from this nut has a good nutritive value, is pleasant and easy to digest, and seems worthy of trial in various nutritional disturbances of early life. Sweet almonds on trituration with water yield a milk-white emulsion having the appearance and somewhat the taste of cow's milk slightly flavored with almonds. The nuts are first finely ground and then covered with water and allowed to stand in an ice-box over night. The following day they are pressed out, using a potato ricer or fruit press, or they may simply be pressed out by hand through four layers of gauze, which is the method usually employed in Chapin's laboratory. One hundred grammes of nuts may be covered with 200 grammes of water, and when squeezed out this is diluted up to 300 Cc. of water (No. III).

Chemical analysis, reported by Kast, of the trituration of almonds and water gave the following results, which are here compared with an average analysis of cow's milk:

COMPLETE ANALYSIS OF ALMOND MILK.

	Fat.	Protein.	Carbohydrates.	Ash.	Water.
I.	5.19	3.3	.86	.36	90.5
II.	6.21	3.9	1.21	.43	87.8
III.	7.02	4.4	1.2	.55	86.74

COW'S MILK.

4.0	3.3	5.0	.7	87.0

MINERAL CONTENT.

	Cow's Milk.	Almonds (whole nuts).
CaO	20.01	14.5
MgO	2.42	18.3
Ma_2O	10.01	1.8
K_2O	25.02	11.1
MnO_2		.3
Fe_2O_3		
Al_2O_3	.13	.8
P_2O_5	24.29	48.1
SO_3	3.84	4.6
SiO_2		.2
Cl	14.28	.3

If heated to 100° Celsius, the solution becomes opaque and gradually deposits a snow-white precipitate amounting to about 10 per cent of the emulsion employed. The almond milk must be kept cool to prevent the fermentation of its carbohydrates. It should be warm but not boiled.

According to Foster, the almond was a highly esteemed medicament in the Hippocratic and Galenical eras, being used as an emulsion in pulmonary affections, in menstrual disorders, and as a diuretic.

There seem to be certain advantages in the use of almond milk that may be considered from both a theoretical and practical standpoint. As regards the former (*a*) it ferments much less easily than ordinary cow's milk; (*b*) it has a higher fat ratio in the form of almond oil which is sufficiently emulsified to render it easily digestible; (*c*) proteins contained in this milk are much less apt to undergo putrefaction than the casein of cow's milk; (*d*) almond milk contains a large amount of phosphorus and a small quantity of sodium chloride, which would suggest its favorable employment in such conditions as rickets and nephritis. From its low carbohydrate content it would also be indicated in various sugar fermentations.

On the practical side, it has been tried on more than 1000 adult cases by Kast, and while some dislike it, actual disturbances have never been caused. Thus far, no patients have shown any idiosyncrasy to it. Patients kept on almond milk alone maintain their equilibrium of metabolism and usually gain in weight. Accurate metabolism experiments carried out by Kast on two adults showed that the nitrogen balance was maintained. In nephritis, typhoid fever, intestinal putrefaction, malnutrition, and secondary anemia, it was particularly well taken and served a very good purpose.

ALCOHOL.

The *Medical Times* for March, 1919, points out that naturally there is a dearth at the present time in the American literature of allusions to alcohol as a therapeutic agent. In the Continental and British press this drug is still properly evaluated, and clinical notes regarding it are of the conventional kind.

Alcohol as a therapeutic agent should never have been confused with the demon rum, but the psychology of the prohibition movement influenced the medical profession to such an extent—naturally enough—that

some of us dragged our scientific anchors badly in the tremendous emotional seas that surged about us.

The *Medical Times* has no doubt that we shall recover our orientation again, with respect to alcohol, and learn to appreciate as of yore its value in a strictly limited clinical field, in which its indications are as well defined to-day as ever.

With saloons scrapped we can afford once again to give some atttention to the well-known narcotic: Alcohol, U. S. P.

The editor of the *Medical Times* writes with a keen realization of the bitter feeling which still prevails in this matter. He would be a fearless man who would dare to plead the cause of alcohol, the useful drug, before his assembled brethren. Two things would be in the air in the case of such an assembly. Half of the members would suspect that the "devil's advocate" was in the pay of the liquor interests, and most of them would feel that the particular society had been betrayed and disgraced by its officers, whom they would be disposed to call to account.

ARTIFICIAL PNEUMOTHORAX IN PULMONARY TUBERCULOSIS.

PETERS, in the *New York Medical Journal* of March 29, 1919, states as one looks back over the years of work one cannot but shudder at the chances taken both in the selection of cases and the amount of gas injected at one sitting. The pioneers in the work, especially Murphy, were in the habit of compressing the lung as rapidly as possible. And Lapham at first advocated the injection of much greater amounts that experience later taught were not only unnecessary but, on the other hand, extremely dangerous. The only possible excuse for the injection of over 400 Cc. as an initial dose is in the treatment of hemorrhage, when, of course, large amounts are necessary to insure a rapid compression and a sufficient pressure on the bleeding part to stop the flow of blood.

Peters speaks of a patient, one of his first cases, who was an excellent gas risk. The pulmonary condition was one of unilateral tuberculosis—very active—the patient running a high fever, and having been under observation long enough to convince him of the hopelessness in her case unless some radical treatment were instituted. Pneumothorax was advised and begun by the injection of 800 Cc. This produced little discomfort and the filling was continued. Symptomatically the results were wonderful, as they are in so many cases. At this time Lapham was called in consultation on another patient, and she went over all Peters's compression cases. Her criticism was that not sufficient gas was being given and that in most cases the lungs were not sufficiently compressed. Acting on her suggestion, larger amounts were injected in all cases. Not having at that time the advantage of an *x*-ray to check up findings, it is now apparent that infinite harm was done many patients. In the case in question the diaphragm was shoved down, and, being a right lung, the liver was pressed down with it. Pressure on the return circulation resulted in edema of the extremities, and, to make a long story short, uremic symptoms developed which proved fatal. There was no relief experienced from letting out the gas, and surgical consultation failed to offer any suggestions as to a line of treatment that might prove beneficial.

During this time many cases were noted in which the mediastinum was pushed over and a partial compression of the opposite side established. One can imagine the discomfort to the patient from such an awkward occurrence. Many times, too, in this early work, high fever resulted from too high pressure. Toxic substances were squeezed into the lymphatics, and the resulting toxemia was a very distressing symptom.

Peters now knows that unless there is a large amount of fibrosis present a pressure maintained at neutral will compress a lung and give perfect results. Only in a very small number does he find it necessary to give a positive pressure, and then never to exceed a +4. Those needing a pressure of this nature are, as mentioned before, the cases that show a large amount of fibrosis.

A positive reading must here be maintained in order to bring as much pressure as possible to bear on the scar area. Otherwise little good can be expected to result.

It is interesting to note in the more recent literature of this subject that practically all men in this line of work are agreed that too high pressure and too large amounts of gas at one filling are without question contraindicated.

Another point that is of great importance, and one that spells success or failure more often than any other feature, is, with the compression once established, the necessity of keeping it complete. Forlanini recognized this in his early work. He even went further and stated that unless such compression were complete the disease tended to spread more rapidly in the compressed lung, due, no doubt, to the increased irritation and the carrying of the products of inflammation into the normal alveoli by means of the lymphatics and blood stream. It is for this reason that when a compression is begun the fillings are given three times a week until the lung is well tied up, and then the intervals are never further apart than two weeks for nearly the first year. In but few cases has Peters been able to let the intervals go longer than a month.

OBSERVATIONS ON INTRASPINAL AUTO-ARSPHENAMINIZED SERUM TREATMENT OF CEREBRO-SPINAL SYPHILIS.

THOMAS, in the *Pennsylvania Medical Journal* for March, 1919, in his conclusions states:

1. It is not claimed that arsphenamine therapy either intravenously or intraspinally can restore degenerated spinal cords or rescue victims from impending institutional care.

2. Although many patients, even tabetics, respond to general or intravenous treatment, the accessory employment of intraspinal treatment accelerates the restoration of the spinal fluid to normal, arrests the degenerative process, and insures greater permanency of therapeutic results.

3. Intraspinal treatment by arsphenaminized or auto-arsphenaminized serum injections should supplement intensive intravenous therapy *only when necessary*.

4. Cases of endarteritis with vascular or circulatory disturbances, and those with exudative gummatous meningitis, also many cases of tabes dorsalis, respond satisfactorily to intravenous therapy alone.

5. Cases with marked tract or cortical degeneration offer little if any hope of improvement by this or any other known method of treatment.

6. Treatment in qualified cases should be continued until the findings in the spinal fluid, as well as the blood, are rendered negative, excepting globulins, which may remain positive in many cases irrespective of the amount of treatment.

7. Mercury and the iodides continue to be indispensable supplementary therapeutic agents in the treatment of cerebrospinal syphilis.

THE MECHANISM OF THE PROTECTIVE ACTION OF CARBOHYDRATE DIET IN PHOSPHORUS AND CHLOROFORM POISONING.

SIMONDS, in the *Archives of Internal Medicine* for March, 1919, states that in phosphorus poisoning there is a rapid disappearance of glycogen from the liver. Beginning about the time of the disappearance of the glycogen, there occur fatty degeneration and infiltration of the liver, increased protein metabolism, and decreased oxidation. In addition there is a reduction of the intracellular ereptase with little or no change in the esterage content of the liver.

The feeding of sugar to phosphorus-poisoned animals conserves and replenishes the hepatic glycogen and markedly diminishes the toxic effect of the phosphorus, as shown by the mildness of the clinical symptoms, by the continued presence of glycogen in the liver, and by the very moderate degree of degenerative changes in that organ. The available data in the literature on the chemical, enzymatic and metabolic changes in chloroform poisoning, acute yellow atro-

phy, and in eclampsia, are not so complete as for phosphorus poisoning, but from the facts at hand there is reason to believe that the differences are more quantitative than qualitative, and that the administration of sugar in these three conditions will have something of the same protective effect as in phosphorus poisoning.

An attempt has been made to arrive at some understanding of the mechanism of this protective action of sugar, or, more correctly, of the conservation and replenishing of the supply of glycogen of the liver, in poisoning with phosphorus. It has been suggested that an adequate supply of glycogen may affect the state of the colloids of the cell: (1) by stabilizing the emulsion and preventing its "breaking" with the throwing out of droplets of fat; and (2) by reducing the permeability of the cells to the poison.

From studies of the literature there is reason to believe that a certain amount of carbohydrate is essential to normal protein metabolism. If it is not supplied in the diet it is obtained by increased breaking down of protein.

In phosphorus poisoning there is a diminution of the power of the body to carry on its normal oxidative processes, and at the same time there is an increased demand for readily oxidizable material. Fat cannot satisfactorily supply this augmented need in the presence of the reduced oxidizing power, because fat is twice as difficult to oxidize as carbohydrate. An attempt is made to meet this increased demand on the part of the liver by the transportation to it of fat which it is unable to burn, and by increased protein metabolism. It has been shown that the liver is able to burn its own glycogen more readily than glucose or many other substances supplied to it.

Many of the changes occurring in phosphorus-poisoned livers are of the nature of an autolysis. The presence of glycogen in the liver appears to inhibit the autolysis of this organ *in vitro,* because it has been shown that autolysis begins more promptly, proceeds more rapidly, and brings about a more complete degradation of the protein molecule in those livers which have been previously rendered glycogen-free by starvation of the animal, or by poisoning with phosphorus, or by the administration of thyroid extract.

It is believed, further, that the autolysis occurring in phosphorus-poisoned livers is the result of a reversed action by those intracellular enzymes which normally carry on the synthetic processes in protein metabolism. On account of changes within the cell, possibly the result of reduced oxidation, the equilibrium point in the enzyme reaction is displaced, and the normal function of the enzyme reversed.

The conservation and replenishing of the glycerin of the liver by the administration of sugar is believed, therefore, to protect the animal against phosphorus poisoning (1) by its effect on the colloids of the cell; (2) by furnishing carbohydrate, which appears to be essential to the normal synthetic processes of protein metabolism; (3) by supplying the most easily oxidizable material to an organ whose oxidizing power has been reduced by the poison; (4) by inhibiting the process of autolysis *in vivo;* and (5) by preventing the reversal of the action of the intracellular enzymes.

It is believed that the facts presented are sufficiently well substantiated to justify the opinion that the administration of sugar will prove to be an important therapeutic measure in phosphorus and chloroform poisoning in humans, in acute yellow atrophy of the liver, and, possibly, in eclampsia.

THE CONNECTION OF MILKSICKNESS WITH THE POISONOUS QUALITIES OF WHITE SNAKEROOT (EUPATORIUM URTICÆFOLIUM).

SACKETT, in the *Journal of Infectious Diseases* for March, 1919, summarizes his article as follows:

Both the fresh, green *Eupatorium urticæfolium* and the dried leaf powder contain an active ingredient which is poisonous for rabbits.

The active poisonous principle is present in plants grown in the greenhouse, as well as under natural out-of-door conditions.

The active constituent is soluble in 95-per-cent alcohol, and its solution yields a solid extract on evaporation which is poisonous for rabbits, but not for guinea-pigs.

The active ingredient is soluble in a mixture of ether, chloroform and ammonia, and its solution yields a solid extract on evaporation which is poisonous for rabbits, but not for guinea-pigs.

The active ingredient is not yielded by extraction with physiologic salt solution.

The active principle is present in the leaves, but not, or only sparingly so, in the stems and roots of dried plants.

There is no indication of anaphylaxis.

So far as is shown by these experiments, neither the leaf powder nor the different extracts are poisonous for guinea-pigs.

The viscera and meat from rabbits which had died from eupatorium poisoning, when fed to a cat, were without harmful action.

No difference in poisonous properties could be noted between plants from a "milksick" and "non-milksick" area.

The fatal dose of the leaf powder differs with the different animals, ranging from 4 to 17 gm.; whereas the ether-chloroform-ammonia extract from 15 gm. given in three doses twenty-four hours apart invariably caused death in four to six days.

Rabbits suffering with eupatorium poisoning usually manifest the first symptoms on the third or fourth day. They refuse to eat, sit humped up, eyes half-closed, and often keep the body swaying from side to side; the respiration is usually shallow, rapid, and jerky. On the following day (fourth or fifth) a flaccid paralysis of the head, neck, and front legs ordinarily develops; this is followed by complete prostration and death in 24 to 36 hours.

The principal pathologic changes occur in the kidney, liver, and heart, where fatty degeneration and hyperemia are very marked.

Poured agar plates made from the heart blood, liver, and kidneys were invariably sterile.

It is not intended to claim that all cases of disease with the symptoms of trembles or milksickness are due to the ingestion of the toxic substance present in eupatorium leaves. Jordan and Harris have shown that a disease with similar if not identical symptoms occurs in a region in New Mexico where eupatorium is not present.

VACCINE THERAPY—THE MOST RATIONAL AND EFFECTIVE METHOD OF TREATING WHOOPING-COUGH.

Bloom, in the *Archives of Pediatrics* for January, 1919, states that during the past three years he has used both the simple and combined or mixed vaccines in about 300 cases.

Constant and quicker results have been obtained when the combined vaccine was used.

Unfortunately autogenous vaccines are not practical for many reasons, namely:

1. In the early stage, when you need the vaccine most, there is practically no expectoration at all.

2. In only rare cases does one secure any sputum whatsoever; hence the inability to culture the organisms.

3. Seldom can one secure a pure culture.

4. By the time the vaccine is delivered the second stage will have been started.

From the very onset of this important subject, when the vaccines were first used, he has felt that perhaps there were two bacteriological factors: one the specific organism, and the other the influenza bacillus. This belief prompted his deliberately using a mixed vaccine from the very start, contrary to the arguments of others.

In his successive combinations the number of Bordet-Gengou bacilli and influenza bacilli, constituting the vaccine used, have been increased in numbers as noted in his formulæ.

In the future, in some of his cases, a vaccine containing these two organisms alone will be tried. Mallory has found two organisms in the dog. The question of the number of injections and time concerns the individual case, and no definite rule can be ascribed to either interrogatives.

The loss of appetite, loss of sleep, and

restlessness, while present in the majority of cases, were not of sufficient importance to alter methods, and had no relation whatever, directly or indirectly, to the vaccine therapy.

As far as complications were concerned, Bloom has yet to note a single case of pneumonia, tuberculosis, etc., in the cases constituting this paper. In relation to the reaction that one notes following the hypodermic administration, rarely does the temperature exceed 101° F.; the temperature is not affected in the greater proportion of the cases.

As a matter of fact, the only evidence of the aftermath is a "hardened knot" described by mothers at the site of the injection. He has never noted a case of anaphylaxis.

ACTIVE TREATMENT METHOD.

1. Site: arm. Tincture of iodine. Alcohol. Luer syringe.

2. *Vaccine.* (*a*) Mixed and concentrated; 1 Cc. = 5,000,000,000. (*b*) Fresh. With preservative; keep in cool place. (*c*) Maximum doses. Start with 5,000,000,000. (*d*) Every other day initial dose—or increasing dose—6,000,000,000 to 7,000,000,000. (*e*) Administer every other day, until one of the symptoms shows marked remission. (*f*) As a rule four or five doses will suffice. (*g*) In critically ill cases the vaccine may be given every day.

3. *Diagnosis.* (*a*) *Early.* Repeated blood pictures (unless there is some concurrent disease). *Lymphocytosis and leucocytosis:* Pay particular stress to an increasing number of lymphocytes in preference to a questionable leucocytosis, for in the second stage his results tend to show a leucopenia rather than leucocytosis—and this fact might deter treatment. (*b*) *Late.* After symptoms are present. Encourage the use of vaccine even in the second stage and occasionally in the third stage. (*c*) *Atypical cases.* Oftentimes we have a case that does not respond to the ordinary cough medications. A study of these will reveal, perhaps, something that we least expected. Constant observation and blood pictures will assist materially.

4. *Treatment.* No medicinal treatment is indicated—unless the unusual occurs—and then symptomatic treatment should be practiced. Sometimes we are forced to give "something" as a parental satisfaction.

5. *Indications.* (*a*) A suspicious cough that does not respond to the ordinary prescription. (*b*) Children who have been exposed and who have not shown symptoms of pertussis. (*c*) Children exposed to whooping-cough and having some symptoms. (*d*) Epidemics.

6. *Dangers.* None.

Bloom reaches these conclusions:

1. Vaccine therapy in pertussis is rational and effective.

2. Experience has proven its efficiency, both as a prophylactic and as an active therapeutic agent.

3. Usage: (*a*) Minimizes loss in weight. (*b*) Reduces the duration of the disease. (*c*) Decreases the intensity of the illness. (*d*) Forestalls the possibilities of complications and sequelæ. (*e*) Unattended by danger of anaphylaxis, etc. (*f*) Limits the mortality.

PREGNANCY TOXEMIA.

MOSHER, in the *Journal of the Missouri State Medical Association* for March, 1919, states that toxemia of pregnancy and eclampsia are due to change of metabolism resulting from faulty proteid and fat, from an undetermined toxin from the growing ovum, resulting in infarcts and other pathological changes of kidney, liver, thyroid, brain, and spleen. These toxins are thrown into the blood stream, the products of autolysis, of placenta infarcts, from which dying particles are carried to the kidneys, liver, etc., and cause focal necrosis.

Hyperthyroidism is only incidental in the vicious circle.

The extra burden thrown on the mother to ward off this poison and to oxygenate the fetus overwhelms her powers of resistance; especially may this result in alternating extreme cold weather and mild days—she being unable to stabilize her powers of resistance. A loss of equilibrium between cen-

ters and periphery or the body causes an acidosis, because of the unstable condition of the metabolism. Failure of elimination results in stasis, decreased maternal oxygenation; lung expansion and heart action are disturbed; asphyxia results; foci of infection—teeth, tonsils, colon infections—may usually be demonstrated in toxemia. Adrenalin output is increased, blood-pressure raised, and blood coagulation abnormally increased in toxemia.

Consequently prophylaxis, including diet, bland foods and plenty of fluids, elimination by magnesium sulphate and sweats, eradication of the foci of infection, are to be planned. Asphyxia is avoided by deep breathing and fresh air. Acidosis is anticipated by alkalies. Blood-pressure is reduced by veratrum, not by phlebotomy.

All other measures failing, the final resort is to empty the uterus. This should be done under ether anesthesia, ether being the only safe inhalation anesthetic in these cases.

Technique which involves least shock:

1. Preliminary dilatation gradually by Hegar's dilators up to No. 20.

2. Voorhees bag No. 4, if at term—introduced by Reed's method—cigarette roll held by Paen's forceps. Gavage of soda bicarbonate, 2 per cent, after uterus is emptied. Cases of the fulminating type, long, hard cervix (in which no vaginal examination has been done), are best treated by classical Cæsarian section.

When after contamination by frequent digital examination infection is almost surely to be expected, a Porro or other hysterectomy should be done, in the interest of the mother. (See Franklin Newell's statistics of results near Boston, 100 per cent mortality.)

A woman without a uterus is better than an anatomical specimen.

The results in the series of cases from which these conclusions are drawn show 95 per cent recoveries of mothers, 5 per cent mortality, and 85 per cent of the children at term. His mortality of 15 per cent at least warrants the belief that since Tweedy's tables showed maternal mortality of 8.1, DeLee 20, Williams 25, Cragin 28, N. Y. Lying-in 30, the average American 38, the Royal Maternity of Edinburgh 66 (these figures being from DeLee's Year Book, 1918), their results are far above the average, or else their cases have been less toxic than those encountered elsewhere, which is not likely to have been the case.

CARE OF THE BREAST DURING PREGNANCY AND THE PUERPERIUM.

Beck, in the *Medical Times* for March, 1919, states that absolute asepsis is admittedly impossible. If, however, we regard the nipples as areas containing many minute orifices each of which is capable of becoming infected we will appreciate the need of employing a routine which is as aseptic as possible. Because fissures are the usual forerunners of mastitis their prevention and prompt relief are essentially a part of the prophylaxis against infection. We should avoid touching the nipples with anything which has not been previously boiled or sterilized. Except for the child's mouth, which obviously cannot be sterilized, this rule can be followed as scrupulously in the care of the breasts as it is in the dressing of a clean surgical wound. The boric acid solution as well as the cotton swabs employed in cleansing the nipples before and after nursing are boiled before using. In the intervals between feedings a piece of sterile gauze strapped over the nipples protects them from contamination. Neither the patient nor the nurse should touch this area with the fingers. The practice of pulling out the nipple before nursing is pernicious, as this structure can be forced into the infant's mouth by holding the tissue in the vicinity of the areola. The nurse should never prepare the breasts for nursing without first cleansing her hands. The patient's nightgown should open in front, or should have a yoke sufficiently low to permitt easy access to the nipples through it. To draw the bottom of the nightgown up over the breast is uncleanly and a fruitful source of infection, since it frequently is soiled by the unsterile vaginal discharge. If the child has

a purulent ophthalmia or a pustular eruption great care should be used to avoid contamination from this source. The use of a breast pump is seldom indicated in the treatment of breast complications. As it frequently causes infection, the common custom of pumping should be discouraged. When indicated an aseptic technique must be employed—*i.e.*, the pump should be boiled before using and contamination should be avoided by not allowing it to touch unsterile objects.

In conclusion Beck outlines the care of the breasts from the standpoint of avoiding failure of lactation.

FAILURE OF LACTATION.

Causes: Tender and fissured nipples.
Treatment: Prophylactic, curative; before delivery, after delivery; early recognition; cleanliness and asepsis; rest—nipple shield; cleanliness; application of liquid petrolatum; proper nursing routine.
Painful Engorgement: Support with breast sling; codeine if necessary.
Anxiety of the Mother: Keep child in another room; don't inform mother of child's failure to gain, etc.; cheerful and optimistic nurse.
Supplementary Feeding: Use only when absolutely necessary; give insufficient amount to satisfy the child; give immediately after breast feeding.
Infection: Prophylactic; avoid fissures; avoid touching nipples with fingers; wash nipples with sterile solution; cover nipples with sterile gauze; don't pump breasts; avoid contamination from eyes and pustules.

POSTURE AND AMYL NITRITE IN THE DIAGNOSIS OF CARDIAC DISEASE.

BENJAMIN and BROOKS, in the *Journal of the American Medical Association* of March 8, 1919, state as to their test that it has been of great aid in their work, and if the procedure has been suggested heretofore, it is very probable that its use has not been generally appreciated. Its value lies in the fact that the separation of the more stubborn cases of simple tachycardia from the persistent ones is facilitated. The individual, on direction, drops the head and bends forward to about an angle of 45 degrees, whereupon the rapid heart will retard to a remarkable degree very quickly, sometimes to half of the original rate, if the case is one of simple tachycardia. The other type is not affected at all. Also in the former instance, the rate in the bending position corresponds fairly accurately to the rate in the recumbent posture. It requires less time to resume a nearly normal rate in the former than the latter procedure, and is thus a quicker method. The test has been applied in a very large number of cases so far with very gratifying results. A certain number of soldiers who have responded to this test have been followed up. They are doing full duty.

This adjunct, in the disposition of a rather difficult group of cases, is recommended for further use and comment by members of the service and the profession, namely: amyl nitrite inhalation as an aid in the diagnosis of presystolic murmurs.

A probable explanation of the large number of cases of mitral stenosis reported from the various camps is the fact that fatigue, excitement, and the influence of new environments cause the heart tones in many instances to become altered in character. The experience at their camp, where a large number of recruits are examined, bears evidence to this fact. This has been true to such an extent that in their reports to the Surgeon-General certain new terms have appeared as characterizing diagnoses, such as "blurring of the first mitral zone" or "reduplication of the first sound at the apex." This has been done simply to indicate that there is possibly some disturbance during presystole, but that there were no other signs present of a definite nature. Also, there has been much discussion among the cardiovascular examiners concerning definite thrills felt at the mitral area. By close observation, however, it is their conviction that the time of the thrill, other than those characterizing mitral stenosis (or a similar lesion at another area) is systolic and due to an overacting ventricle. In most instances a recumbent position, or exercise, causes the systolic thrills to disappear. As suggested above, the same difficulty has been experienced by other observers, and various tests have been suggested as a means of establishing a certain diagnosis, or excluding it.

Their purpose in this paper is to advance the results of our observation in the use of amyl nitrite inhalations as an aid in this difficulty. The procedure was recommended by R. A. Morison. This investigator suggested, after a fair trial of the nitrite, that a valuable aid is at hand to eliminate the difficulty in the diagnosis of the existence, or non-existence, of presystolic murmurs. They have followed his method in each instance.

The division surgeon procured fifty ampoules of amyl nitrite, containing 3 minims each. These were used in all doubtful cases. Of course the influence on the heart, as far as it concerns the experiment, is very similar to the effect of exercise. However, there is one great advantage: it is possible to listen to the heart during its period of increasing activity and acceleration, and there is no attending dyspnea as a disturbing factor. In other words, as the patient administers the drug to himself, the observer listens at the apex of the heart until the desired effect of the drug is produced. In this way several phases of increasing cardiac activity are observed.

A total of forty-eight cases has been examined, and it is the opinion of the observers that a very valuable aid in diagnosis has been obtained. In ten cases the doubtful nature of the presystolic sound was intensified to such a degree as to admit of a positive diagnosis of mitral stenosis. In the balance of the cases the suggestive presystolic sounds were eliminated. It might be said here that the greatest difficulty was experienced in the negro, for here the element of neurosis is clearly manifest, and this influence on the heart produces at times varied changes. Chief among these are a greatly accentuated pulmonic second and a very loud sound at the apex and a thrill at this area, the timing of which is frequently difficult. In such cases they have found recourse to these inhalations valuable.

Naturally a report of this nature partakes entirely of personal experience, as there is no definite way to publish the data. The chief object in presenting their observations is to corroborate thoroughly the findings of Morison, and to suggest the further use of this method.

A CLINICAL STUDY OF MENINGITIS BASED ON TWO HUNDRED AND FIFTEEN CASES.

In the *Archives of Internal Medicine* for March, 1919, STONE and TRUITT conclude as follows:

1. The early diagnosis of abortive types of meningitis, especially during an epidemic, is important.

2. Although recognizing the importance of carriers and their relationship to instances of the acute disease, it is doubtful if carriers can be detected early enough during the course of an epidemic to limit its spread.

3. Intimate contacts, such as tent-mates, close bed associates in the barracks, and close mess-table associates, should be cultured upon the development of a case of the disease. If a carrier is found he should be isolated, receive the simple treatment before outlined, and be kept in isolation until four or five negative nasopharyngeal cultures have been returned. These may be taken at two-day intervals.

4. Early energetic treatment is of greatest importance. This embodies, especially in those manifesting petechiæ, intravenous and intraspinal therapy. The following plan is recommended: First day, one intravenous injection of from 60 to 80 Cc. serum and two intraspinal injections of from 30 to 40 Cc. each after spinal drainage of from 45 to 55 Cc. of fluid, depending on its pressure; second day, same, except that from 80 to 100 Cc. of serum should be given intravenously, and two spinal injections; third and fourth days, if necessary, repeat; fifth to eighth day, one spinal injection; ninth and tenth days, one spinal drainage daily.

5. It has always proved wise to desensitize before giving the first intravenous injection, by a subcutaneous injection of 1 Cc. of serum. The intravenous injections should be given slowly, at the rate of 1 Cc.

of warmed serum per minute for the first 10 or 15 Cc. If anaphylactic symptoms occur the injection should be stopped and the attempt repeated later. Adrenalin chloride, 1 Cc. of the 1-to-1000 solution by hypodermic injection, relieves the symptoms of anaphylaxis. Atropine, grain 1/100, by hypodermic injection is also useful. The serum is mixed, not shaken, with an equal volume of salt solution, as it is less apt to clog the needle.

6. If patients have been given a number of intraspinal treatments and subsequently an intravenous injection is contemplated, extreme care in its administration is necessary to avoid serious symptoms of anaphylaxis.

7. Overtreatment after the first ten or fourteen days may do positive harm.

8. The actual and differential polymorphonuclear leucocyte count is of value in prognosis.

THE THERAPEUTICS OF RADIUM.

The report of Dr. Arthur Burrows, radiologist to the Manchester and District Radium Institute, for 1918, describes the work done during that year and contains also a summary of the lessons that have been learnt and the results obtained during four years. The number of persons applying for treatment has increased and reached 648 in 1918. In 48 cases of malignant disease the patient was rendered free from symptoms and signs during the course of the year, and 18 out of 33 cases of rodent ulcer treated to a termination were cured. In the summary of the four years it is stated that practically all early rodent ulcers can be cured by radium alone. To date, 31 cases have been well for two years or more, and of a number of other patients who have not reported it is believed that many are still well.

With regard to the treatment of malignant disease, it is observed that at present only inoperable cases are treated by radium. In its use various factors have to be considered; extremely rapidly growing tumors, like melanotic sarcomata, cannot be expected to yield good results; it is also true that carcinoma of the tongue does not usually respond favorably to radium. Extremely large growths are apt to slough and ulcerate, and the tendency to resolution is small. Growths involving bone cannot as a rule be satisfactorily treated, but a case of periosteal sarcoma is illustrated, which remained well for twelve months and then died of another disease. Tumors which retain some mobility, have a good blood supply, and are surrounded by healthy tissues, generally respond best to radium treatment. So far it has not been satisfactorily demonstrated that the histological nature of the tumor, with a few exceptions, has much bearing on the immediate result of radium treatment.

The best results from radium treatment have been obtained in carcinoma of the cervix of the uterus. These cases are always treated by burying five to seven platinum tubes, the walls of which are three-tenths of a millimeter thick, containing altogether not less than 120 millicuries of radium emanation. The tubes are maintained in position for twenty-four hours by gauze packing. The quantity of emanation used must vary somewhat with the size of the tumor, but it is found that the best results are not obtained if not less than 120 millicuries are used. This heavy dosage is, of course, somewhat of a drain on the resources of any radium institute.

From a numerical list of the cases of malignant disease of all varieties treated at the Institute it appears that thirty such cases previously deemed inoperable have been well for a period of two years or more. Radium has a very remarkable and rapid effect on certain local tumors. Lymphosarcoma disappears rapidly, but fresh tumors continue to arise in distant lymphatic glands. Glioma or gliosarcoma of the orbit disappears within a fortnight, but returns. Good results are obtained in some sarcomata, notably inoperable sarcoma of the superior maxilla. The local lesions of Paget's disease of the breast, as a rule,

clear up, but as the formation of secondary deposits in the breast and glands is to be expected, a radical operation should be advised. Individual secondary carcinomatous glands, if not too large, rapidly disappear if treated by burying radium tubes in their substance, but infection of glands at a distance commonly ensues. Another point made is that radium treatment may render operation possible in carcinoma of the breast, of the bladder, of the cervix of the uterus, and for the removal of sarcomatous masses. Apart from all this, radium is of great use in relieving the discomfort of patients suffering from hopeless cancer. It is employed to relieve pain, heal ulceration, check discharges, stop bleeding, and thus to improve the general health of the patient.

An appeal is made to the supporters of the Manchester Radium Institute to provide more suitable premises and special beds for the treatment of cases in which it is thought desirable to bury tubes of radium emanation in the growths. Well lighted, well ventilated premises are very essential for the welfare of the radiologists and the nurses.—*British Medical Journal*, March 15, 1919.

THE DIAGNOSIS AND TREATMENT OF SYPHILIS.

Donald, in the *Glasgow Medical Journal* for February, 1919, states that the only point in diagnosis he would like to emphasize is the routine examination of all venereal sores by the aid of the dark-ground illumination. We often meet cases with developing or advanced "secondaries," which give the history that some weeks previously they had a slight abrasion of the penis which healed itself with no treatment, or perhaps the application of a little black wash obtained at the nearest chemist's.

Every practitioner who is treating syphilis must acquaint himself with the technique of demonstrating the spirochæta pallida by the dark-ground microscope and make a routine of its use. If he fails to find the spirochæta pallida on his first scraping he must make many examinations. Antiseptics should not be used to heal venereal sores until the dark-ground examination is completed and the organism demonstrated or otherwise; indeed, the sore should not be healed till such time. Vigorous local treatment should then be commenced by mercury or by hectine. He has seen cases of innocent looking abrasions, and cases of supposed scabies, being at once confirmed as syphilis by the dark-ground microscope. A sore that has been treated with antiseptics will not show the spirochæta and should be dressed with normal saline for a few days before examination. Sometimes help is obtained in these cases by puncturing with a hypodermic needle a neighboring enlarged gland, which may clear up the diagnosis by examining the serum under a dark-ground microscope.

Again, in what seems an ordinary case of balanitis, a careful examination must be made for any abrasion or other lesion on the glans or surrounding parts and a microscopic examination of these carried out.

It is well to keep such doubtful cases under observation for three or four weeks if possible. It will thus be seen that the routine use of the dark-ground microscope in diagnosing the exact nature of a venereal sore is invaluable and will often save time in commencing antisyphilitic treatment to the benefit and cure of the patient, when otherwise one would require to wait till such time as the blood would reveal the condition. As the stethoscope is to the physician in importance, so is the dark-ground microscope to the syphilologist.

In regard to the great importance of early diagnosis of syphilis it has been shown that the chances of cure from a full course of "606" and mercury are as follows—in primary cases approximately:

(1) Spirochæta pallida present—Wassermann minus and minus after provocative dose, 100 per cent cures.

(2) Spirochæta pallida present—Wassermann minus and plus after provocative dose, 85 per cent cures.

(3) Spirochæta pallida present—Was-

sermann plus and plus (stronger) after provocative dose, 70 per cent cures.

Donald draws attention to the fact that chancres of the meatus urethræ and the throat are frequently overlooked, and it is only when secondaries have developed that it is recognized that a chancre has been missed in one or other of these regions.

Since he took part in the discussion on the treatment of syphilis at the Royal Academy of Medicine in Ireland last March, he has slightly modified the course of treatment in the hospital under his charge and which he gives in detail. He mentions the different preparations he has used as follows: Salvarsan, kharsivan, arsenobenzol, arsenobillon (and their neo and nova preparations), galyl, luargol, and intramine.

The first four (salvarsan, kharsivan, arsenobenzol, and arsenobillon) he is using exclusively, and they give equally good results.

Formerly galyl (arsenic preparation with phosphorus tacked on) was used on occasions, and although it seemed to clear up symptoms rapidly, it evidently was not so efficacious or destructive to the spirochetæ as the other drugs, as relapses were frequent.

When used intramuscularly it did not kill the spirochetæ. The advantages claimed for it are that it is easily dissolved and mixed and given by a Record syringe intravenously, and that it is not toxic. Although supposed to be non-toxic, cases of reaction with convulsions, albuminuria and dermatitis have been recorded. He has seen a number of cases treated with luargol (a preparation of arsenic with silver and antimony in combination), but cannot speak as to its lasting effects. It is easily mixed, but tends to cause thrombosis. It is claimed that it is useful in later cases of syphilis and syphilis of the nervous system. Intramine and ferrivine, both introduced by McDonagh, have not been used, at least in the army. Donald saw eleven cases treated by intramine with no marked improvement ten to fourteen days after the treatment. He has used it in extreme cases of arsenical dermatitis, but is not convinced of its benefit. Ferrivine he has not used, but believes it was tried at one military hospital and gave rise to alarming symptoms of dyspnea and shock immediately following the administration.

The routine treatment of syphilis carried out at Spike Island Military Hospital is as follows:

On admission the following particulars are taken of each case:

(1) 1st, 2d, 3d attack or relapse.

(2) Date and place of three last exposures.

(3) Main points in history.

(4) Condition on admission: (*a*) Condition of penis; (*b*) condition of lymphatics; (*c*) mucous membrane lesions; (*d*) skin lesions; (*e*) reflexes and other signs or symptoms.

A Wassermann and dark-ground examination is made on admission in every case, whether clinical signs are positive or not.

INJECTIONS.

Day	Intravenous "914" or "606"	Intramuscular "914"	Intramuscular Mercurial cream
1st	0.45	....	M x
8th	.. .	0.45	"
15th	0.45	....	"
22nd	rest	rest	"
29th	....	0.45	"
36th	0.6	....	"
43rd	....	0.45	"
50th	0.6	....	"
Total	2.1 gms.	1.35 gms.	M lxxx

Total of "914" in full course, 3.45 gms.

From Donald's experience it is advisable to adopt the course of giving one week's rest after three weeks' treatment. As the majority of intolerances show about this time, it is also advisable that daily observations should be made at this stage of treatment.

When the drug used in the above course for the intravenous injections is of the "606" series, the same doses can be given. A Wassermann test is again done immediately after last injection. If negative, patient is discharged from hospital and reports for blood test in two months. If positive, he is given a follow-up course of two injections of 0.6 gm. intravenously, of either "914" or "606," or is discharged to

his unit and put on a course of chronic mercurial treatment as follows:

Hydrarg. cum creta, 2 grains;
Pulv. ipecac. co., 2 grains.

Ft. pil.

The pills are to be taken as follows: One a day for one week; two a day for one week; three a day for four weeks. This course to be repeated twice, with one week's rest before recommencing.

Caution.—If it is noticed that the teeth ache in their sockets or the gums become inflamed, the pills should be stopped for three days before recommencing with one a day.

Intravenous injections of "914" series are all made up to 10 Cc. with distilled water, irrespective of the dose of "914" given.

Intravenous injections of the "606" are dissolved and neutralized in the usual manner, but the amount of saline given is in proportion to the amount of drug administered. A dose of 0.3 gm. of "606" is made up to 90 Cc. with normal saline solution—0.4 gm. equals 120 Cc., or otherwise 30 Cc. for every 0.1 gm. Litmus paper is used to insure alkalinity. It must always be remembered that the "606" series are acid and must be rendered alkaline before use, while neo or "914" series are not acid and only require dissolving in distilled water. The full course in the "606" series, which is always given intravenously and in bulk, is commenced with a 0.3-gm. dose for the first three injections, 0.4 gm. for the next three injections, and finished up with the dose of 0.5 gm., a total of 2.6 gms. being given in all.

The *intramuscular* injections are as a rule all 0.45-gm. doses of "914," and 7 minims of distilled water is used to dissolve each dose; when dissolved each dose is made up to 1 Cc. with mixture of creosote and camphor.

Novarsenobillon he has found most satisfactory for intramuscular injections, being easily dissolved in the small quantity of distilled water (7 minims), giving a clear solution, and producing decidedly less pain than the other preparations in use.

PROPHYLACTIC USE OF MIXED VACCINE AGAINST PANDEMIC INFLUENZA AND ITS COMPLICATIONS.

MINAKER and IRVINE, in the *Journal of the American Medical Association* of March 22, 1919, state that the facts presented undoubtedly indicate that a noteworthy degree of protection against influenza and its complications was obtained by means of a mixed vaccine freshly prepared from predominating etiologic bacteria. These observations should also encourage further work along the line of immunity against pneumonia. To this end an attempt is now being made to group the Type IV pneumococcus with the object of adding it to a vaccine when needed.

THE TREATMENT OF VENEREAL DISEASE.

REID and BOYDEN, in the *British Medical Journal* of February 8, 1919, state that every great war has been followed by an increase in venereal disease, so marked that on occasions it has amounted to a pestilence. Unless timely sanitary precautions are taken the greatest of all wars is unlikely to furnish an exception to the rule.

One of the authors has been in medical charge of a rapidly changing body of men generally numbering about 2000. Up to the end of 1916 venereal disease was common among them in spite of numerous moral lectures and in spite of adequate provision of what is known as "early treatment"—that is, disinfection after the "contact" has returned to quarters. At the beginning of 1917 a new system was instituted. The men were instructed to disinfect themselves immediately after danger had been incurred—just as a surgeon would disinfect his hands. This procedure is what is known as prophylaxis. It differs from early treatment merely in that the man carries the disinfectant and uses it immediately. Each man who applied was given an ounce of solution of potassium permanganate (at first in a

strength of 1 in 2000, later in a strength of 1 in 1000), a small swab of cotton-wool, and careful directions. Potassium permanganate was chosen merely because it happened to be the most accessible disinfectant. The rationale of the procedure was fully explained, so that in an emergency the man could purchase the materials from any chemist. During 1917 and 1918 about 20,000 men passed through the station, and among them precisely seven cases of venereal disease occurred—six of gonorrhea and one of syphilis. Of the six cases of gonorrhea, two only were contracted by men on leave, in each case from the man's own wife. Two of the others were drunk and took no precautions. The fifth man was infected the night he arrived, and he also, being unaware of the system, took no precautions. The sixth man practiced early treatment an hour after intercourse. The man who acquired syphilis also carried no disinfectant, and used it (permanganate and calomel) two hours after intercourse. He had a long prepuce, and therefore a sensitive glans, and probably did not—probably .could not—rub in the calomel vigorously.

The other author commenced prophylaxis against venereal disease in the Royal Navy in 1907. Some eighteen months ago he took over medical charge of an establishment numbering over 2000 officers and men. The amount of venereal disease, and especially gonorrhea, was considerable, and it was recognized that of the men who stated that they had used the so-called "dreadnoughts" some 40 per cent contracted the disease. For the past nine months the method of immediate prophylaxis by means of the application of a solution of potassium permanganate (1 in 1000) has been employed, with results as striking as those mentioned above in the case of the soldiers. Not a single case of gonorrhea occurred amongst those employing this method, and only one of syphilis. This latter made the application about six hours after exposure to infection, and may therefore be counted out. Unfortunately the navy is a very conservative body, and many men still persist in sticking to the "dreadnoughts." But in lectures given on the subject of prophylaxis men are gradually being convinced of the simplicity and efficacy of immediate prophylaxis. The calomel cream is still reserved for those who have omitted to carry the permanganate solution on their persons, as it seems likely that the former affords some protection, even if an hour or two has elapsed since the risk of infection has been run.

It will be seen that no man who followed instructions and disinfected himself immediately acquired disease. Evidently the time element is of extreme importance. Probably there is no special virtue in potassium permanganate. Any other active antiseptic would be equally effective. But permanganate is the cheapest disinfectant and the best known to the public, the least poisonous, and least irritating.

A PRELIMINARY REPORT ON THE RECENT "INFLUENZA" EPIDEMIC IN DUNEDIN, NEW ZEALAND.

FITCHETT, BOWIE, and CHAMTALOUP, in the *New Zealand Medical Journal* for February, 1919, state that absolute rest of body and mind were of the first importance in treatment. This in the early days of the epidemic was difficult to secure, as numerous daily admissions of serious and wildly delirious cases to a hospital depleted of its trained nursing staff necessitated frequent rearrangement of patients, and the noise and confusion resulting militated against sleep. But the more they were able to refrain from moving patients, and to impress upon their voluntary workers that noise was injurious, and to secure sleep to the patients by the maintenance of quiet and by the use of suitable drugs, the greater was the measure of their success in treatment. Movement had often an injurious effect. Even careful removal of a convalescent patient to another ward not infrequently resulted in a relapse. So jealous were they of disturbing patients that they reduced physical examination to a minimum.

Position they think next important. Apart from the advantage afforded by the Fowler position in facilitating breathing, they believe that this position has an important influence in preventing the spread of the disease from base to apex of the lung. They were led to this conclusion both by observation of post-mortem findings and by clinical evidence which served to show that gravity influences the extension of the disease. As far as possible with the nursing facilities available their patients were kept strictly in the Fowler position. With delirious patients this was not feasible, and the head of the bed was raised on high blocks instead.

In our attempt to combat the disease the following drugs and other therapeutic agents were used:

Quinine was extensively used, chiefly in the form of the Burney Yeo quinine-chlorine mixture. At first they were favorably impressed, several cases seeming to benefit; but a wider experience made it doubtful if the course of the disease was modified by the use of quinine, and the drug was discarded. Several cases of severe pneumonia of the lobar type were given quinine hydrochloride in ten-grain doses every two hours for four doses. In two of these cases the temperature promptly fell several degrees and the course of the disease seemed to be favorably influenced, the patients ultimately recovering; but the results as a whole were not sufficiently striking to encourage an extensive usage in this connection.

Sodium salicylate, or aspirin, was administered as a routine measure in all early uncomplicated cases. The pains and discomforts of the patients were relieved and the temperature often fell, but the course of the disease was not influenced favorably, nor were complications prevented.

Vaccines.—In about twenty-five selected cases a vaccine consisting of B. influenzæ, epidemic diplococcus, pneumococcus, streptococcus, and staphylococcus pyogenes aureus, isolated from recent cases, was administered on admission, and before the appearance of complications. No beneficial results followed this line of treatment, and it was abandoned. The sudden, overwhelming onset of the epidemic precluded the use of vaccines as a prophylactic measure.

Serum from Convalescent Patients.—Early in the epidemic the question of administering serum from cases that had recovered from a sharp attack was considered, but it was found impossible under the adverse conditions to carry out the necessary Wassermann and hemolytic tests; moreover, there was difficulty in procuring the relatively large quantity of serum required for each case. Two cases, however, were treated in this way, but with no apparent benefit. The importance of applying the Wassermann test was shown by the fact that of the four persons selected as donors one gave a strongly positive Wassermann reaction.

Mercury.—The formula issued by the Public Health Department containing mercury and iron was given fair trial, but it proved of no value and so often disturbed the gastric functions of the patients that its use was abandoned.. Inunction of mercury in the form of blue ointment was tried in several cases, but without favorable result.

Eusol.—As in England intravenous injections of eusol had been used with advantage to combat the toxemia and counteract the acidosis present in cases of bronchopneumonia in children, they thought it well to try it here. In a few cases 60 Cc. eusol was given intravenously. Faulty technique made it doubtful if the full dose was received in some cases; but in two cases in which the dose was certain a transient feeling of well-being and improvement followed. In a few hours, however, the symptoms were aggravated, and the general result was not such as to encourage a continuance of this method of treatment.

In their endeavor to relieve the engorgement and edema of the lung the following therapeutic measures were tried:

Counter-irritation. — Mustard plasters, poultices, antiphlogistine, and dry-cupping were freely used and in some cases con-

tributed to the comfort of the patient for a time; but they were of no distinct or permanent value.

Turpentine Inhalations.—Strong inhalations of turpentine (1 ounce in 4 ounces of boiling water) gave decided relief in many cases by facilitating the expectoration of the exudate.

Ammonium carbonate in ten-grain doses every two hours resulted in some cases in the expectoration of mugfuls of white frothy sputum and gave relief; but more often no benefit followed its use.

Potassium iodide did not help, and vin. antimoniale pushed until nausea ensued conferred no benefit.

Belladonna as the tincture was given freely in mixture and atropine sulphate was administered hypodermically in doses of 1/100 gr. every hour until physiological symptoms appeared, but with no decided advantage.

Adrenalin in doses of 5 to 10 minims of the liquor was given hypodermically in several cases with the idea of increasing the lumen of the bronchioles. In one chronic asthmatic patient great relief followed, but other cases were not benefited. It is open to question whether, in view of the already congested state of the lungs, this treatment was advisable, but no harm resulted.

Intramuscular Injections of Saccharose.—With the object of diminishing the bronchial secretion, injections of a saturated solution of cane-sugar as recommended by Monaco were administered to a few patients in doses of 2.5 Cc. twice daily. The result in these cases was doubtful.

For the Relief of Cough.—At first they were so impressed by the respiratory difficulty of patients that they hesitated to use so powerful a respiratory depressant as heroin and preferred codeine given as the syr. codeinæ phosph. by the mouth in doses of one drachm repeated at short intervals, or as codeinæ phosphas hypodermically in doses of ¼ gr. every four hours. It usually gave relief. The supply of codeine running out, however, and their experience teaching them that rest must be secured even at the risk of depressing the respiratory center, they resorted to heroin, and found that doses of 1/12 gr. were usually sufficient, though some cases required ⅛ gr. Combinations of morphine and hydrobromic acid were also used with benefit.

To Support the Respiratory Center.—Strychnine was freely given in a majority of the cases. Doses up to 1/15 gr. every two hours were prescribed for patients in difficulty, but it is hard to say that the end in view was reached. As a preventive of respiratory depression liquor strychninæ in doses of five minims thrice daily was given early to the patients who were threatened with a severe attack, but whether with advantage is not clear. Strychnine was also used to counteract the depressant effects of morphine and other hypnotics.

To Support the Circulation.—Alcohol was used as a stimulant, chiefly in the form of brandy, in doses of 6 to 8 ounces in the twenty-four hours. Transient improvement often followed, but there was no enduring effect. It served best as an explosive stimulant. It was also used for its narcotic action and food value in delirious and in convalescent cases. The delirium was so violent that the mild narcotic effect of alcohol was of little avail; but in convalescent cases a beneficial action was evident. The patients experienced a feeling of well-being, ate more heartily, slept more soundly, and progressed more rapidly toward recovery under its influence. Alcohol had no apparent effect in combating the toxemia of the disease.

Digitalis was administered as the tincture in doses of 90 minims daily, as the fresh infusion up to a dose of half an ounce every two hours, and as Guy's pill. It seemed to have no effect.

Strophanthus as the new pharmacopœial tincture in doses up to five minims every hour did not make a favorable impression.

Strophanthin, 1/250 gr. intravenously, was tried in several cases, but without evident benefit.

Caffeine in doses of five grains every four hours was of doubtful value.

Pituitrin, 0.5 to 1 Cc. of the 20-per-cent

solution, repeated two or three times daily, was used in several cases, but with no obvious advantage.

To Combat Delirium and Promote Sleep.—Of all the drugs used hypnotics afforded most satisfaction and gave greatest and most enduring relief. These writers are satisfied that many lives were saved by the use of these drugs, which would have been lost inevitably without them. The following were used:

Hyoscine hydrobromide alone in doses ranging from 1/100 to 1/25 gr., and hyoscine combined with morphine.

Chloral hydrate alone in single doses up to 30 grains, or 10 grains repeated every twenty minutes for four doses.

Chloral combined with morphine and with potassium bromide.

Veronal (given always in solution) alone in doses of 5 to 10 grains, or combined with ⅛, 1/6, or ¼ gr. of morphine.

Trional (in solution) up to 26 grains.

Sulphonal (in solution), 30 grains.

Paraldehyde, 1 drachm repeated in fifteen minutes.

Morphine alone up to ¼ grain.

Of these, hyoscine was the most generally useful and the least injurious. In one case 1/25 gr. was used with advantage; in many cases 1/50 gr. was given, but the most satisfactory dose was 1/75 gr. An excellent combination was hyoscine and morphine, the morphine being added in doses up to ¼ gr. One life was unquestionably saved by exhibiting hyoscine 1/50 gr. and morphine 1/6 gr. in combination.

Chloral was most useful in selected cases, but it should not be used with impunity. In cases showing much pulmonary engorgement or edema it had an injurious effect. It was used to greatest advantage in delirious cases in which the lung symptoms were not pronounced.

Veronal acted very favorably in certain cases, especially when combined with morphine; but it cannot always be relied upon. No injurious effect was seen.

Trional was most effective in several wildly delirious cases, the patient awaking in his right mind after a prolonged sleep—in one case extending to two days.

Paraldehyde was remarkably successful in several cases, but the difficulty of repeating the dose in mentally alienated patients was insurmountable.

Sulphonal was only used when the supply of trional became exhausted. It did not act so efficiently.

THE TREATMENT OF STAMMERING.

STIVERS, in the *Southern California Practitioner* for March, 1919, states that physical defects must be remedied as far as possible. Hypertrophic cryptic tonsils containing foci of infection, from which poisonous toxins are constantly given off, thereby lowering the bodily resistance, should be removed. Care must be taken that the removal is skilfully done, that permanent injury to the muscles used in speech be not inflicted.

Adenoids, postnasal hypertrophies, septal deviations, tongue-tie, carious teeth, crowded or malocclused teeth should receive proper attention. No operation *per se* will cure stammering, but may put the physical body into better condition to be the servant of the mind. Stammerers have poor voluntary control of their speech mechanism, including breathing, which is usually of a shallow, catchy nature. As speech is built out of breath, the stammerer must be taught breath control. Diaphragmatic breathing should be taught by lecture and example, emphasizing the fact that it should be the aim of the stammerer to practice diaphragmatic breathing at all times, and not only when in the teacher's presence.

As stammering is associated with an interruption of the breath, and as stammering never occurs when the breath is being expired freely, the aim in treatment should be to keep the breath flowing freely, in fact, to insist on an exaggeration at first of the breath in the tone.

The stammerer's attention is directed to the faulty sounds he makes, and he is shown, by comparison, the correct sounds.

Syllabication or dividing words into syllables is one of the best exercises, and much training may be given to it. Mental drill, for poise and relaxation, and the use of suggestion and autosuggestion, are useful adjuncts for the treatment of the mental instability.

Short poems dealing with simple subjects may be memorized and used in recitations to emphasize the sound, form, and color of the different words. Learning something, and doing something which by repetition the stammerer can do well and usually without stammering, has a marked value in that it assists in the restoration and continuance of the self-confidence which he lacks.

The treatment of a stammerer should not be undertaken lightly, and never without the full coöperation of parents—especially the mother. It is her duty usually to see that the stammerer practices several times a day. To her falls the task, also, of supervising the minute details of the patient's life; regulating his diet, sleep, exercise and play according to his necessities. In very nervous children an hour or two spent in complete rest in bed, in the afternoon, will go far to conserving nervous energy.

As the treatment of stammering is practically the supervision of the entire life of a child for a period of from six months to several years, it is the province of a physician of wide general learning as well as special training to undertake these cases.

TREATMENT OF EARLY SYPHILIS.

GIBSON, in the *British Medical Journal* of February 8, 1919, states that it is necessary in treating early syphilis to have a definite system of work, and to keep records for a stated term before making any deductions.

Mercury alone can cure many cases of syphilis, if persisted in for a sufficiently long time, but it is questionable if a course of less than two years is of any value at any stage of the disease.

With salvarsan and its alternatives, however, the term of active treatment can be greatly shortened, and in the very early stages of the infection the disease can be aborted, although it may be advisable to keep the patient under observation for two years.

The following observations are made from the standpoint that a positive reaction is indicative of syphilis in its secondary stage, and that the disappearance of the positive reaction for six months after treatment with mercury has been discontinued is evidence of cure. These views are easily open to controversy, but he has not seen a case of secondary syphilis—which has not had any treatment—give a negative reaction; nor has he seen a secondary syphilis which gave a negative reaction for six months after treatment with mercury and salvarsan was discontinued again develop a positive blood test, unless reinfected.

In the scheme he suggests the terms "primary" and "secondary" are interpreted not according to clinical signs but according to the blood test.

The primary or prepositive stage extends from the date of infection until the blood test becomes positive. The length of this stage is variable, depending on many factors, such as the virulence of the infection, the resistance of the individual, and the delicacy of the test. He would put it at less than six weeks. In secondary syphilis the blood test has become positive, even though the clinical signs may not have appeared.

COURSE OF TREATMENT OF PRIMARY SYPHILIS.

(Neokharsivan, novarsenobillon, or galyl given by intravenous injection; mercury intramuscularly.)

Day	N, or NAB	or Galyl.	Mercury.
First (consultation)	....	....	gr. j
Second	0.45 gram	0.25 gram	....
Ninth	0.45 "	0.25 "	gr. j
Sixteenth	0.6 "	0.30 "	gr. j
Twenty-third	0.6 "	0.30 "	gr. j
Thirtieth	0.75 "	0.35 "	gr. j
Thirty-seventh	0.75 "	0.35 "	gr. j
Forty-fourth	0.9 "	0.40 "	gr. j
Fifty-first	0.9 "	0.40 "	gr. j

N=Neokharsivan. NAB=Novarsenobillon.

This constitutes a course, but if the patient can stand two further weekly injections of mercury he prefers to give them. Local inunction of calomel ointment is ordered for the chancre.

At the end of five weeks potassium iodide gr. x is given three times a day for a week, and a blood test performed. If this

is negative another test is performed twelve weeks later, and if this is negative the case is looked on as cured.

In many very early cases this course may be too long, but for the bulk of cases it is good, and from it satisfactory results may confidently be anticipated.

In the secondary syphilis stage it must be presumed that a profound change has taken place in the patient; consequently the prognosis is not so good, and the treatment must be correspondingly lengthened. The course advocated for primary cases is given, and at the end of six weeks, if the blood test is negative, a second course of six weekly injections of mercury gr. j is given. This is followed by three similar courses at intervals of eight, ten, and twelve weeks. If the reaction is negative twelve weeks after the fifth course, a wait of another twelve weeks is enjoined before another test is performed. If this is negative the patient is looked on as cured. The idea by which the scheme is inspired is to nurse the case toward a six-month negative blood test.

The total length of time that a favorable case of secondary syphilis is under observation is seventy-four weeks, during which there are thirty weeks of active treatment.

The object of giving potassium iodide at the end of a definite time after the mercury is that Gibson thinks it gives a better chance of getting a positive blood reaction. This may or may not be so, but he does not believe that iodide can render the reaction negative, as he has seen cases of obstinate tertiary palmar and plantar lesions in which iodide has been given for very long terms still show a strongly positive reaction.

The iodide is not given immediately the mercurial course is finished, as he has seen cases which stood the mercurial injections well develop mercurial poisoning when the iodide was given too early. The drugs he used for intravenous injection have been galyl, neokharsivan, and novarsenobillon. So far as he was able to judge, the results have been pretty much the same with all these preparations. Novarsenobillon is the most readily soluble and can easily be given with a syringe. Should any of the solution get into the subcutaneous tissues the pain—which is slightly delayed—is very acute. What he means by "slightly delayed" is that the swelling caused by the effusion of the solution is noticed for some minutes before the patient complains. The subsequent reaction of the tissues is very great. The local effects of slight effusion of galyl and neokharsivan are not so great. Galyl, in the earlier days, was not readily soluble and did not appear to be always uniform in composition—that is, judging by the look of the solution—but this seems to have been remedied in the later preparations. Mercury emulsions of 10 per cent, 20 per cent, and 40 per cent have been used.

He finds that private patients bear intramuscular injections of mercury better than hospital cases, and in the latter class miners and footballers often complain so bitterly that oral administration has to be substituted for the intramuscular method. Should a positive test be obtained after the first course, then three intravenous injections of one of the salvarsan alternatives are given with the second course, which is called an intermediate course, but this does not interfere with the second, third, fourth, and fifth courses. This means a lengthening of the whole course of treatment by six weeks and of observation by twelve weeks.

The causes of bad results are:

1. Age. Patients contracting syphilis after the age of forty seem to have more difficulty in becoming cured, as judged by the blood test, than younger cases.

2. The longer the delay in starting treatment after infection the more disappointing are the results, and *vice versa*.

3. A virulent infection. This may be explained either by a low resistance of the individual or a high virulence of the syphilitic virus, or a combination of both. Clinically, it appears impossible to state when one is dealing with such a case. He would, however, state that it is difficult to get and keep the reaction negative in rupial syphilis.

4. Alcoholics are a class in which it is

difficult to get good results, and for this reason total abstinence is always enjoined.

5. If the teeth are bad and the mouth septic, as so often happens in hospital cases, oral administration is to be preferred to the intramuscular method, because if the gums are "touched"—a point of saturation with mercury to be aimed at—an uncontrollable stomatitis is liable to be set up.

6. There are a limited number of persons who do not stand mercury well, and in these the prognosis is not good. There are also a limited number who show idiosyncrasy to intravenous medication with arsenical compounds. Gibson would give a more guarded prognosis in the case of secondary syphilis with idiosyncrasy to mercury than in the case of idiosyncrasy to arsenic compounds.

Suppose a man presents himself with an early chancre on the penis and states that he has exposed his wife recently to infection, it seems debatable whether the woman ought not to be given a few intravenous injections of salvarsan substitutes. He quite admits that it could never be known whether she had been saved from general infection or not, but when we consider the enormous difference between early and late treatment it seems a suggestion worthy of further thought.

THE TREATMENT OF EMPYEMA.

SAVAGE, in *Minnesota Medicine* for March, 1919, states that the one great and burning question is, Shall these cases be operated on early when the fluid is thin and watery; or shall they be treated by aspiration, or by some other palliative method, until the pus becomes thick and creamy?

When he first reported at the Base Hospital at Camp Custer, in the winter of 1918, every man who had a streptococcic fluid in his chest was promptly subjected to a rib resection. The shock of the operation itself was slight as compared to that produced when the inrushing air displaced the heart and collapsed the lung on the operated side. The mortality was 30 per cent. One of the nurses remarked that Sherman may have been right, but that he had never seen Ward 14.

At a later period a series of cases were treated by aspiration, valve drain, cannula drainage, and catheter drainage, in the effort to avoid the unfortunate results of early resection, namely, heart displacement (with its accompanying drag on the great vessels) and collapse of the lung. Sixteen cases were resected when the pus was creamy, and but one died. The surgical service began to think they had solved the problem. It developed, however, that during this period fifteen cases were treated by aspiration only, with ten deaths—mortality 66⅔ per cent. The total mortality in this same period was about 55 per cent. In other words, in exactly the same types of cases, which formerly gave a 30-per-cent mortality with prompt rib resection, the total mortality of all cases was nearly doubled; but the deaths were recorded by the medical and not the surgical service.

These figures refute the statements of the empyema commission from Camp Lee, published in the *Journal of the American Medical Association* of August 10, 1918. Their statement is as follows: "The evacuation of the pleural exudate by operation early in the disease involves greater risks without compensating benefits than the removal by aspiration. Much of the relief offered by operation, without its attendant dangers, can be afforded by aspiration, repeated according to indications. The condition of the patient at this time calls for medical rather than surgical treatment."

If a patient can be tided over the early stages by aspiration, the operative statistics will be far better than if every case is resected early, but the total number of deaths will be greater. One is not dealing with the ordinary type of empyema as found in civil life, but with a fulminating toxemia with large quantities of fluid rapidly formed. One of his cases had 6000 Cc. withdrawn by aspiration in seven days—nearly one quart per day.

The statement was recently made at a clinical lecture at Bellevue Hospital that two schools had developed in the matter

of handling empyema cases. One advocated early operation; and the other, aspiration early, and resection later.

In the opinion of Savage a compromise position is the procedure of choice. The Brewer tube, connected with a negative pressure system, and used early in the disease, gives good drainage and at the same time prevents extreme collapse of the lung and displacement of the heart. This method was used at Custer in some 10 cases up to May 25. Up to that time the results were satisfactory. The tube is inserted in the axilla, between the ribs, under local anesthesia. There is practically no shock or pain. Resection is done at a later period, but in the meantime, enough pleural adhesions are formed to prevent extreme collapse of the lung, and the mediastinum is sufficiently anchored by adhesions to prevent any marked heart displacement.

When the pus is not localized, resection of 4 cm. of the eighth rib, beginning at the angle and extending outward, seems to be the most satisfactory site of operation. This permits of the use of the Carrel-Dakin method of treatment and gives dependent drainage during convalescence.

The value of the Carrel-Dakin method of treatment has been fully demonstrated. The practice at Custer was to introduce four tubes while the patient was still on the table. As a rule the first flushing was done on the table. The occasional case with a bronchial fistula may not permit of use of this method. Once a day the cavity is completely emptied and flushed until the solution comes away almost clear. After this the customary two-hour treatment is used.

Recent work seems to show that the chlorine content of Dakin's solution in an empyema cavity diminishes so rapidly that if the weight of a chest full of fluid is unpleasant, good results may be obtained by leaving it in the chest fifteen to twenty minutes only, and not replacing it until the two-hour period is up.

Recent figures from the War Demonstration Hospital, in connection with the Rockefeller Institute, show that 50 per cent of their empyema cases have been discharged to duty within three months.

Before the Carrel-Dakin method was systematically used at Custer, it was a common experience to find a small, non-expansile lung, with a large pus-discharging cavity, two months and more after operation. After this method was instituted the improvement in the ward was striking. The odor of pus almost completely disappeared, the wounds began to take on a healthy appearance, and the general condition of the patients markedly improved.

In the first series of cases, thirteen out of sixteen showed negative bacterial counts in from four to ten days.

With a negative bacterial count, but with the patient continuing to show septic symptoms, one should look for a pocket of pus not communicating with the main cavity, or for some additional pneumonic involvement, or for a distant pus focus. Given a case with a negative bacterial count, a normal morning temperature with a pulse of 90, but with an afternoon temperature and pulse of 100, one would expect to find a walled-off pleural or interlobar pocket of pus. For example, if the original empyema had shown a general right-sided involvement, and the clinical picture after three or four weeks was as above described, one would expect to find an apical pocket, showing a fluid level on *x*-ray examination as high as the second or third rib, or a pocket lying between the pericardium on the inner side and a compressed lung on the outer side. In the latter case the needle inserted just below and to the inner side of the right nipple would show pus.

Localized pockets are opened as may be indicated in each individual case.

The earlier an empyema cavity is rendered sterile, the less fibrous tissue there will be to keep the lung contracted, the earlier the opening may be closed surgically or allowed to granulate in, and the quicker the lung will re-expand. Last, but not least, there will be less probability of pocket formation.

PREVENTION AND TREATMENT OF PNEUMONIA AND OTHER RESPIRATORY INFECTIONS BY MIXED VACCINES.

JOHNSON, in the *New Zealand Medical Journal* for February, 1919, summarizes his article as follows:

1. Anaphylactic and antianaphylactic phenomena play a very important part and are valuable guides in vaccine therapy, especially in diseases of the respiratory tract. Serological tests are not satisfactory guides or reliable indicators of established immunity or of practical service in the carrying out of treatment with vaccines or sera.

2. The very important part played by symbiosis in bacterial infections of the respiratory organs cannot be too strongly emphasized. The clinical results of therapeutic and prophylactic inoculation with mixed vaccines lend strong support to these views.

3. A constitutional weakness in the elaborate defensive organization against invasion by the causative microörganisms of respiratory disease indicates a "pneumocatarrhal diathesis." This constant diminished resistance can be successfully reversed by specific immunization with a highly multivalent mixed vaccine prepared from numerous recently isolated virulent strains of those pathogenic bacteria commonly conveyed in the air breather. Non-specific treatment is of no avail.

4. Roughly, less than 25 per cent of cases diagnosed as pneumonia in general practice are due primarily to infection with pneumococcus, the proportion varying from time to time. In all cases of pneumonia, however, the condition is sooner or later a mixed infection in which any of the causative bacteria of respiratory diseases may be present. M. catarrhalis and streptococcus are the commonest in South Africa. Pneumococcus, Bacillus Friedlander, B. influenza, streptococcus mucosus capsulatus, staphylococcus, B. septus, are also regarded as important organisms in the etiology of pneumonia.

5. Whatever theoretical objections may be raised to this statement, the clinical results in practice both of therapeutic and prophylactic inoculation for pneumonia with a mixed vaccine afford overwhelming evidence as to the soundness of these views. The mixed vaccine used is prepared from 150 virulent recently-isolated strains of M. catarrhalis, streptococcus, pneumococcus, streptococcus mucosus capsulatus, B. Friedlander, B. influenza, B. septus, and staphylococcus. Each organism is represented in a curative therapeutic dose, the actual dose used being somewhat less than the amount required when each organism is used separately.

6. These views have been strongly confirmed and widely tested on a very large scale in South Africa during the prevailing epidemic of Spanish influenza, the very heavy mortality being due almost entirely to pneumonia. The mortality from pneumonia has been greatly reduced by therapeutic inoculation with mixed vaccines. Similarly, prophylactic inoculation with larger doses of this mixed vaccine has reduced the incidence of influenza and prevented pneumonia, fatalities in individuals inoculated twice being rare.

7. The failure of preventive inoculation against pneumonia with various pneumococcus vaccines is due to a false or incomplete conception of the etiology of the disease broadly diagnosed as "pneumonia." This want of success is not due to faulty dosage of pneumococcus vaccine or the absence of unidentified strains of pneumococcus. If pneumococcus vaccine was of definite value proof would have been forthcoming long since, in view of the numerous experiments which have been carried out on a large scale.

8. This failure is due to the fact that the etiological significance of other microörganisms has not been recognized. The organisms in addition to pneumococcus are M. catarrhalis, streptococcus, streptococcus mucosus capsulatus, B. Friedlander, staphylococcus, B. influenza, and B. septus. That the incomplete and inaccurate views in regard to the etiology of pneumonia have survived so long is due to the modern

development of "water-tight compartments" in medicine. The clinician is not a bacteriologist. The bacteriologist is not a clinician.

9. Prophylactic inoculation with mixed vaccine prepared from the organisms enumerated will enormously reduce the incidence of pneumonia and other respiratory diseases (excluding tuberculosis) and largely abolish the mortality from these diseases. The actual composition of the vaccine and proportion of each organism represented in the mixed vaccine should be decided from a close and extensive study of the bacteriological flora found in respiratory diseases.

INTRASPINOUS THERAPY IN UROLOGY AND SYPHILIS.

HOWARD (*Northwest Medicine*, February, 1919) quotes Swift to the effect that in syphilis there is a round-cell infiltration of the vascular wall and its supporting structures to a considerable extent. This relatively impervious state of the small vessels of the arachnoid and pia may explain why in some cases remedies do not reach the cerebrospinal fluid via the blood stream and why the situation is so aptly solved by placing the remedy directly into the cerebrospinal fluid.

The syphilization of the spinal meninges in the form of a perivasculitis effects two changes which concern the urologist, viz., (1) an irritation of the sensory nerve roots, causing pain and paresthesia; (2) a trophic desquamation of the posterior column of Goll and Burdock, resulting in incoördination and ataxia. The pain, depending upon the nerves involved, may simulate those arising from prostatitis, seminal vesiculitis, colliculitis, cystitis, renal colic, etc. The ataxia, when affecting the nervous control of the bladder, causes a disturbance of the function of micturition. It becomes, therefore, the first duty of the urologist to determine the presence or absence of tabes, and he frequently finds it to be the cause of the urinary disturbance complained of.

Coulk says, at the conclusion of an analysis of 117 cases: "In other words, almost 50 per cent of the patients suffering from diseases of the central nervous system may have as their initial symptom a disturbance of bladder function, such as frequency, dribbling, and the like."

Biochemical changes in cerebrospinal fluid characteristic of syphilis are: (1) complement fixation, (2) pleocytosis, (3) globulin, (4) gold chloride precipitate, (5) spirochetes present.

The Wassermann reaction, of course, is pathognomonic and requires no comment further than that large amounts of spinal fluid should be used, up to 2 C.

Pleocytosis is chiefly confined to the lymphocytes. The number varies from 4 to as many as 300 or 400, according to the severity of the process.

Globulin, as demonstrated when a layer of cerebrospinal fluid is laid over a saturated solution of ammonium sulphate, is confirmation, indicating the presence of an inflammatory process.

The precipitation of gold chloride solution by the protein of the cerebrospinal fluid in varying dilutions, resulting in change of color from the orange red of the gold chloride through purple-red, purple, blue, gray-blue, to colorless, known as the Lange test, is highly valued by nearly all writers. Many even value it above the Wassermann test. It furnishes helpful evidence when a differential diagnosis is being reached between tabes and paresis.

Intraspinous therapy for syphilis of the cerebrospinal system is the replacement of a certain amount of the fluid by an equal amount of a suitable menstruum, containing the specific drugs. Various menstruums have been found, but none so suitable as the patient's own blood serum. The specific drugs added are arsenobenzol and mercury. Both can be added directly or indirectly or both ways at the same time—indirectly in the case of arsenobenzol, by it being recovered in the serum of a patient previously injected intravenously, and, in the case of mercury, in the serum by it being administered by inunction. The indirect administration of mercury into the cerebrospinal

fluid has been practically abandoned because of the infinitesimal amounts secured, but the indirect administration of arsenobenzol into the cerebrospinal fluid is very popular and is known as the Swift-Ellis method.

The direct administration of arsenobenzol with serum as a vehicle is not so popular as that of mercury in the form of the bichloride.

Six cases are reported treated by subdural injections of serum taken from a patient half an hour after an intravenous administration of 0.6 gm. of arsenobenzol. To this serum the indicated quantity of bichloride of mercury may be added. To one familiar with the fluctuations, apparently causeless, which occur in the course of chronic syphilitic infection of the central nervous system the case reports are unconvincing.

THE RELATION BETWEEN TONSILLAR INFECTION AND RECURRENT VOMITING.

TAYLOR (*Minnesota Medicine*, February, 1919) notes that the striking features of typical attacks of recurrent vomiting, their periodicity, the prostration and intoxication accompanying them, no less than the prompt cessation of symptoms and the rapid recovery of the patient, have for twenty years received much attention from the clinic and the laboratory.

Griffith, in 1900, reported the presence of acetone in the urine of one patient during the attack. This finding was confirmed the next year by Valagussa. Marfan then wrote describing the symptoms of the disease, and its constant association with acetonuria; but considered that the acetone was merely the companion of other toxic and more truly pathogenic substances as yet unknown. Marfan further pointed out that in recurrent vomiting the acetonuria was not due to starvation, as in some instances it was present before the patient had refused food. Howland and Richards concluded that while the presence of acetone bodies could be considered as owing to carbohydrate starvation, they might well be dependent on insufficient combustion of ingested carbohydrates. They formulated the theory that insufficient oxidation processes were in part responsible for the symptoms, and supported this by finding in the urine during the attack increased amounts of partially oxidized substances, neutral sulphur, lactic acid, and uric acid. Sedgwick's finding of large amounts of creatin in the urine of children during the attack may also be explained as indirectly due to diminished oxidation.

That the acetone bodies are not in themselves the cause of the symptoms was finally and conclusively shown by Mellanby, who, in 1911, withdrew carbohydrates from a child subject to recurrent vomiting and produced acetonuria, but did not produce vomiting. Nor are the attacks due to dietary indiscretion, to indigestion, or to biliousness in the old sense. The majority of opinion of those having the largest experience with the disorder has been voiced by Marian and by Abt, each of whom states that diet during the interval has no effect on the occurrence of the attack.

It is difficult to conceive that a metabolism which functions perfectly for a period of months will then suddenly become subverted and turn out incompletely oxidized toxic products, without there being present some cause which was not active during the interval. Sedgwick was the first to lay the responsibility for the attacks of vomiting directly at the door of infection when, in 1912, he reported eight cases in all, of which the patients were either entirely cured or much improved by the removal of adenoids or tonsils. He also reviewed the literature to that date, finding evidence of infections, sore throat, arthritis, coryza, epistaxis, etc., in the older reports and studies on recurrent vomiting.

Because of the criticisms aimed at wholesale slaughter of tonsils and adenoids, and in order to satisfy himself of the validity of considering the presence of recurrent vomiting as an indication for the removal of tonsils and adenoids, Taylor studied the case records of the 47 patients treated in

the Mayo Clinic previous to the close of the year 1917, and in whom a diagnosis of recurrent vomiting of childhood had been made. Many of these were severe cases. In most instances the children have been brought to the clinic, often from long distances, in the hope of obtaining relief from the attacks. On the whole the patients would seem to be representative of the typical form of the disease. Their average age on coming to the clinic was about seven years; the average age at onset was about three years. The attacks lasted for from one day to two weeks, with an average duration of three or four days; their frequency varied from three or four to twenty or more a year. In eight instances the attacks were associated with abdominal pain, usually dull and indefinite. Appendectomy had been performed in three instances, and appendectomy and cholecystostomy in one, without relief of the symptoms. Septic tonsils, or enlarged infected adenoids, or both, were present in 40 of the 47 patients; four of the remaining seven had hereditary lues, two of these having had their tonsils and adenoids removed elsewhere without benefit; and one improved under specific treatment. One of the patients with hereditary lues had small non-septic tonsils and adenoids, while the record of the fourth contains no mention of the nasopharynx. Of the remaining three patients, two with mild infrequent attacks had small apparently normal tonsils and adenoids, while the third, a brother of one of the two, had had his tonsils and adenoids cleanly removed elsewhere, without benefit. Both this patient and his sister were of the neurotic type, and had had severe eczema in infancy. The removal of tonsils and adenoids was advised in 32 of these patients. The remainder were sent home with tonic prescriptions, advice as to diet, laxatives, and general hygiene.

To summarize the evidence obtained from these records of 47 cases of recurrent vomiting, we find that in 40 there was evidence of tonsillar or adenoid disease. In six of the 24 patients whose tonsils and adenoids were removed, no further information could be secured. One of the remaining 18 patients is unimproved, five are very much improved, and 12 have had no attacks since operation, this period varying from seven months to six years.

THREE HUNDRED EXTERNAL CORNEAL WOUNDS.

BAKER (*Ohio State Medical Journal*, March, 1919), has taken this report from the 1918 alphabetical index cards of accident cases, as the histories of the men from various shops were being filed.

Of the 300 cases recorded, 87, or about 40 per cent, were superficial wounds of the epithelial layer of the cornea. The other 213 cases showed wounds of the lamina of the cornea. Since first-aid nurses are employed in the shops in which many of these men work, a number of superficial wound cases are not included, as the nurses removed the foreign bodies and gave first-aid treatment, no further attention being required. About one-half the recorded lamina cases come from shops in which first-aid nurses are not employed.

The numerous infections of the cornea, complicating improperly treated lamina cases, would seem to warrant the publication of these notes. From the data collected it seems only fair to conclude that at least one-half of the minor corneal wounds, occurring in shops, need expert attention, if ulcers and maculæ, with their resulting pain, loss of time, sight, and industrial indemnity, are to be avoided.

But there is a deplorable tendency on the part of so-called industrial surgeons and first-aid nurses to grab these cases on the ground that they are not serious. Members of the profession, really competent in treating eye cases, who see many of these corneal wound cases after their initial treatment, cannot but realize that they have not been properly handled. Frequently the lamina is denuded of the epithelial layer over a surface area several times larger than need be on account of awkward attempts to dig out bits of emery or metal, and in many instances just enough of the

foreign body has been left in the bottom of the wound to infect it and cause corneal ulceration.

In practically all such instances of improper handling, had these patients been sent to competent eye specialists as soon as the presence of a foreign body was detected, the offending particle could have been expeditiously and completely removed, the corneal wound adequately disinfected, and the case so treated that the workmen would have lost little or no time, and would have been spared sleepless nights of pain and inconveniently sore eyes.

The Industrial Commission pays an eye doctor no more for handling this class of cases than it does any other doctor, so there is no valid economic reason why all such cases should not have the best of expert care. It would seem that manufacturers are not making as thorough use of the benefits of industrial insurance protection and safety-first principles as the public, and more especially the workers in the shops, have the right to expect.

Employers, workers and doctors have found out that infections complicating industrial accidents do not pay, and everything is being done to obviate them, but it remains to be seen how much longer trifling with corneal wounds will be tolerated by those most concerned.

URINARY DIAGNOSIS FOR TREATMENT.

PETERKIN (*Northwest Medicine*, February, 1919) describes the technique, not without its merit, of collecting urinary specimens from the female, and illustrates in such wise as to make his article both entertaining and instructive. This is the typewritten instruction given to the patient:

"The little envelope accompanying these instructions contains bichloride tablets, with directions on the outside: 'Dissolve one tablet in a glass of water.' As this solution is poisonous, the glass containing it should be carefully rinsed several times with scalding hot water after using. Then, as a further precaution against poisoning by using it for drinking purposes, let the glass remain filled with hot water for a considerable length of time.

"Place in this bichloride solution three or four pieces of cotton made into sponges the size of a golf ball; or use Bernay's antiseptic sponges. If the latter are used, compress with fingers until sponges become thoroughly saturated and assume shape of a round ball.

"With the index and middle fingers of the left hand open lips of vagina well, keeping them apart, and cleanse mouth of urinary tract (meatus) by rubbing slowly from above downward with sponges. Never rub sponge a second time over meatus; throw sponge away; and while keeping labia (lips of vagina) well open repeat the same movement with second sponge. Then squeeze out third sponge, and after rubbing over meatus, insert into vagina so that no vaginal discharge can escape.

"Nurse or patient then places the bottle over the opening from which urine escapes, and patient urinates directly into bottle. After urination take sponge out of vagina.

"1. Void urine in bottle marked 'night' on going to bed.....evening, the.....

"2. In bottle marked 'morning' void urine as soon as getting out of bed.....morning, the..... If urine has to be voided during night, partly fill bottle with it; and fill remainder of bottle on morning urination.

"3. Then hold urine in bladder from.... a.m. on..... the....., until you come to the office at ..... o'clock."

The patient is instructed as to definite time to urinate for the following reasons:

The urine is taken at night just before retiring, for the kidneys after a day's exertion are more apt to show through fatigue pathologic conditions which otherwise might not be so apparent, as a machine after hard driving is more likely to show weak parts, if they exist.

The urine is taken the first thing in the morning on arising, in order to ascertain the condition of the urinary tract after a period of eight hours' rest, during which time it is not cleansed (by the passage of urine) of any bacterial infection present.

Moreover, this length of time permits the growth of a few microörganisms to a sufficient number to prevent their being overlooked, especially if the specimen is centrifuged.

The urine is held for a definite period of four hours (the usual time it takes to fill the bladder) before coming to the physician's office, in order to standardize the premises from which all deductions are made, so permitting definite clinical and laboratory conclusions to be formed.

Thereafter follow nine reasons for this technique and a demonstration of the time and labor saved by its observance.

FOURTEEN POINTS CONCERNING OPHTHALMIA NEONATORUM.

ALLFORT (*New York Medical Journal*, March 1, 1919), following an illustrious example, formulates fourteen points which he considers especially important.

First. Ophthalmia neonatorum is responsible for about twenty per cent of the blind in the United States and for about twenty-five per cent of the inmates of blind asylums.

Second. It costs about thirty dollars a year to educate an ordinary child, and about four hundred dollars a year to educate and care for a blind child. This does not take into consideration the many financial and sociological sidelights to blindness, and the personal and municipal misfortunes incident to blindness, and unproductive citizenship.

Third. There are about fifty blind schools in the United States, costing about two million dollars a year to maintain.

Fourth. Ophthalmia neonatorum costs the United States about seven million dollars a year in actual money.

Fifth. Next to optic nerve atrophy, ophthalmia neonatorum is the most prolific cause of blindness in the United States.

Sixth. The Credé treatment for all newborn children would almost entirely eliminate ophthalmia neonatorum and its dreadful consequences from the world.

Seventh. The use of this evidently necessary treatment is by no means universal, and its omission is not confined to midwives. Some reputable physicians use it invariably; others never use it; still others use it when conditions are suspicious. In order to accomplish its purpose the use of this treatment should be invariable. It should become recognized as an integral part of a woman's confinement, and as a reliable provision against blindness. It should be understood that gonorrhea is not the only condition that will produce this disease, but it may occur from other and non-disgraceful causes.

Eighth. Midwives are a financial and sociological necessity. Fully one-half the confinements are attended by midwives. If it were not for midwives most of these cases would be merely looked after by friends and relatives. Midwives should be educated, examined, licensed, and inspected, and should always call in medical assistance in complicated cases. The first school of this kind was established in 1913 at Bellevue Hospital, New York, and has abundantly proved its usefulness. Intelligent women are receiving these instructions, and many graduate nurses have undertaken midwifery as a profession.

Ninth. Births should be compulsorily reported within a few hours. The ocular condition should be reported, and the physician should state whether or not he has used the prophylactic treatment. The method of using the prophylactic and the State law (if any exists) should be printed on the report blank. Immediate action should follow reporting. By action is meant medical attendance (hospital preferred), nursing, etc.

Tenth. Suitable laws should be passed in each State providing for the invariable use of Credé's prophylaxis in all newly born children, and proper penalties should be imposed for the non-observance of such instruction. Such laws should be not only enacted but observed. A few punishments for disobedience would result in the universal state observance of the law. Laws in themselves are not sufficient; they must be obeyed. One of the best means of in-

suring such obedience is to create intelligence on this subject, by propaganda, publicity, etc. Every legitimate method of educating and enlightening the people, the midwives, and the doctors should be encouraged. If this is done, and proper laws are passed and obedience enforced, it will not be long before the Credé idea of preventing much needless blindness will become a matter of course, and its use demanded by expectant mothers and their families.

Eleventh. While not prophesying as to what the future may produce, in the way of prophylaxis, it is reasonably certain that at present there is no remedy that can take the place of nitrate of silver. Argyrol, protargol, collargol, and many other remedies have been proposed, enthusiastically indorsed, widely used, and gradually abandoned. Nitrate of silver alone has stood the test of time. The ideal remedy is of course one that reliably destroys the microorganisms, does not injure the eye, does not produce prolonged redness, does not cause pain, does not deteriorate by time, light, or exposure, and one that can be used freely.

Unforunately, nitrate of silver only responds to one of these qualifications, viz., it reliably destroys the microörganisms. It does, however, sometimes injure the epithelium, produce prolonged redness, cause pain, deteriorates by time, light, and exposure, and should not be freely used. There is, therefore, room for improvement, and it is hoped that a perfect drug will be found; but until then nitrate of silver should be the standard remedy, for it can almost invariably be depended on to destroy the microörganisms, and after all that is the main thing to be considered. Besides this all the objections to its use are really trifling, and can be easily overcome. Cases of injuries to the epithelium are extremely rare: continued redness is not often seen; the pain is slight and temporary; deterioration can be overcome by only using absolutely fresh solutions; and it is easy to only use one or two drops. Many careful observers believe that the two-per-cent solution of Credé is unnecessarily strong and severe, and that just as good results will be attained by a one-per-cent solution, thus reducing by one-half the objections to its use. It is quite possible that this view is correct. It should not be forgotten, however, that cases in which a two-per-cent solution have produced really objectionable results are extremely rare, and might have been easily due to drug deterioration, rather than to drug strength. The cloudiness in a deteriorating silver solution is due to the liberation of free nitric acid, which is, of course, very irritating to the delicate ocular epithelium.

In order to provide free and reliable silver solutions some States and cities prepare and distribute fresh and carefully compounded solutions to doctors and midwives on application. For instance, New York State distributed last year nearly 20,000 outfits of a one-per-cent solution of nitrate of silver. Circulars in English, Italian, and Polish were freely distributed through about 1600 health officers to doctors and midwives. It cost about $5000. Think of the economy of this measure, to say nothing of its benefits to individuals, families, municipalities, and mankind in general. Free distribution does not imply parsimoniousness on the part of doctors and midwives. It is done to provide aseptic solutions to prevent accidents in writing prescriptions and in druggists' work, to insure against drug deterioration, etc.

Twelfth. One almost insurmountable difficulty in the way of proper treatment of ophthalmia neonatorum is the paucity of resources in combating the disease. This disease apparently has no friends. Nobody wants it around. A small hospital should be established in all large cities for the prompt reception of such cases. Or it should be clearly understood by health officers, doctors, midwives, and visiting nurses that certain hospitals will receive such patients, in special wards, at any time, day or night, and undertake to provide expert medical attendance, care, day and night nursing, etc. Mothers who are nursing their babies should either stay with them or come at stated intervals if possible to continue the nursing. Its progress is swift and

terrible. A few hours may mean permanent blindness. There is no time to wonder what can be done. This should all be understood beforehand, and prompt action immediately taken. Private homes, especially of the squalid variety, are no places for the treatment of this disease.

Thirteenth. Health departments in the larger cities should employ an experienced eye nurse to search out and follow up cases of ophthalmia neonatorum, and to see that immediate action is taken when cases are found.

Fourteenth. The author believes that great benefit can be accomplished by the free and frequent distribution of brief and pointed pamphlets, printed in several languages, by some central organization such as the National Committee for the Prevention of Blindness. Such leaflets should be sent to different organizations in the different States, such as boards of health, dispensaries, etc., to be freely and frequently distributed to doctors, midwives, expectant mothers, etc. The author then submitted a sample of such a leaflet:

WHAT TO DO BEFORE THE BABY IS BORN.

1. The care of a child's eyes begins *before* it is born.

2. The mother's parts, through which the child passes at birth, should be washed several times a day with soap and water, for about one week before the baby is born.

3. If a discharge comes from these parts, the mother should at once consult a doctor at his office or go to a free dispensary, for this discharge, if not stopped, will be a *terrible poison* to the baby's eyes.

4. This discharge may be caused by the "Bad Disease," or it may not. In either case it should be stopped, *or a blind baby may be the result.*

5. If for any reason a doctor is not consulted, the mother should not only keep her parts clean with soap and water, but she should get a fountain syringe and syringe out her parts, several times a day, with warm, boiled soap and water.

6. The mother should be careful to keep her hands clean and to keep her hands away from her eyes, or she may get some of the poison in her own eyes, and cause blindness.

7. All cloths, etc., used by her in cleaning her parts *should be burned,* as they may be full of poison. It is better to get quantities of cheap cheese-cloth and then burn it.

8. If the mother has a discharge coming from her parts she should keep away from the other people in the family as much as possible, for she may poison them and cause the same disease, and possibly blindness.

9. If the mother has a discharge, she should try and use a separate water-closet or vessel, and keep everything perfectly clean with soap and water cleansings.

10. *It would be better for babies to be born in hospitals,* where everything is convenient and clean, and where the mother may be sure of a good doctor and nurse, and where, if mothers are too poor to pay out money, they can be cared for free.

11. If the mother does not go to a hospital she should, if possible, call in a good doctor, as midwives are unsafe.

12. If the mother is poor, she should not forget to call a visiting nurse. *They know their business* and *can tell the mother* what to do.

WHAT TO DO AFTER THE BABY IS BORN.

1. As soon as the head is born the mouth should be swabbed out with a cloth upon a finger, the face should be washed with clean water, and the lids should be especially cleaned.

2. After the child is separated from the mother, the face should be again washed, *without soap,* giving especial attention to the lids.

3. The eyes should now be washed out with a solution of boracic acid. To do this, take a pint of clean water that has been boiled and allowed to cool. Then put two teaspoonfuls of boracic acid in the water and stir it up with a clean spoon. Then open the baby's eyes and flush them out with a few teaspoonfuls of this solution.

4. The lids should now be opened and two or three drops of a two- or one-per-cent solution of nitrate of silver should be carefully dropped into the eyes.

Be sure the medicine gets *into* the eyes.

This should be done *always,* even in cases in which there is no reason to suspect disease.

It almost surely prevents dangerous "babies' sore eyes!"

5. The drops usually make the eyes a little red for a few hours, but this does no harm.

If it is not done, a blind baby may be the result.

6. Mothers should be *sure* that this is done, *even* if the doctor does not think it necessary.

7. Mothers should not think that breast milk, or tea-leaves, or poultices, or *anything else,* will serve the purpose. Cleanliness and the nitrate of silver solution are the only things that will do; *especially the silver solution.*

8. If the baby's eyes get red a few days after birth, *the baby should be taken to a good doctor at once.* Or, better still, take the baby to a good eye doctor *at once.*

9. Do *not wait,* thinking it is "just a little cold," and hoping the eyes will be better in a day or two.

10. Do not listen to what the neighbors say. *Consult a doctor at once. Delay may mean blindness to the baby.*

11. If a newly born baby has "sore eyes," the best place for it is *in a good hospital,* where it can be properly cared for. Such cases require careful treatment *every half-hour day and night.* If the child is not taken to a hospital, however, *two* paid nurses, or *two* visiting nurses, should take care of the baby, day and night.

All this could have been prevented if the silver solution had been dropped into the eyes when the baby was born!

12. All cloths, cotton, etc., used around the baby's eyes should be *instantly burned.* Every one touching or treating the baby should keep perfectly clean. *The hands should always be washed immediately after touching the baby.* People coming in contact with a baby having

"sore eyes" should, if possible, be kept in a *separate room,* away from the rest of the family.

On the first or outside page will be the following printed matter:

Babies' sore eyes and how to prevent them.
Cleanliness and two drops of the following formula would have prevented this child from becoming blind.
(Picture of a blind child.)
Nitrate of silver, eight grains, or four grains.
Distilled water, one ounce.
Put two drops in the baby's eyes immediately after birth. The face and lids should first be cleaned with pure warm water.
This formula can be obtained at any drug store, and must be used on every baby.

THE LIMITATIONS OF CÆSARIAN SECTION.

ZINKE (*Ohio State Medical Journal,* March, 1919) thus concludes a study of this subject: Abdominal Cæsarian section is positively indicated, as in the past, in all cases in which the child cannot be delivered by any means, dead or alive, through the parturient canal.

The operation is not only justifiable, but almost imperative, and should be selected as the best mode of delivery in all cases of deformed, narrow, and contracted pelves in which the diameters are so reduced in size as to forbid the test of labor, the use of the high forceps, or version of the child upon the feet.

Abdominal hysterectomy will furnish the best results for both mother and child in all of those cases of placenta previa in which the hemorrhage is moderate, protracted, and beyond control. When an elongated or unobliterated cervix or rigid os complicates placenta previa, Cæsarian section is all the more imperative. Fortunately, in the majority of these cases, the hemorrhage may be effectually suppressed; elongated cervices are quite rare; and an unobliterated cervix, or rigid os, usually yields to well-applied tamponade, or the careful and skilful use of the rubber bag.

Cæsarian section may be chosen as a just procedure in cases of profound eclampsia, or even in the milder cases when the life of the child is considered of equal, or more, importance than the life of the mother. Intelligent medical care has greatly decreased the maternal mortality of this disease. This fact, more than anything else, renders Cæsarian section almost entirely unnecessary in the treatment of eclampsia.

As to the advisability of abdominal hysterotomy in cases of asthenia, no matter what the cause, the justification of the operation rests upon the nature and accurate judgment of an able, conscientious, and experienced attendant. That, occasionally, both lives may be saved by resorting to this operation in these circumstances, may be admitted; but that the operation will be only rarely indicated for this condition also admits of no doubt.

In the past Cæsarian section was not performed often enough; at the present time it is resorted to too frequently. In order to guard against an abuse, it may be well to establish the custom that the Cæsarian operation should never be performed without the consent of an experienced consultant of recognized standing and, if possible, an authority on the practice of obstetrics.

The Cæsarian operation should never be regarded lightly because it is easy of performance; on the contrary, it should always be considered a formidable procedure which is apt to be followed by very serious consequences, and that, even under the most favorable circumstances, it invariably means an abdominal and uterine cicatrix; and, not infrequently, more or less extensive adhesion between the uterus, abdominal wall, omentum, and intestines. In addition to this, it is well to remember that the danger from a septic infection cannot, and never will be, entirely eliminated.

The question as to whether an existing septic infection is a contraindication has been discussed repeatedly. Judging from the favorable results reported by men who have performed Cæsarian section when the patients showed symptoms of "infection," one is led to believe that the cases in which recovery did take place were not really of the type coming under the head of true septic infection, but rather cases of mild sapremia. The former is always systemic and almost invariably fatal, the latter is usually local in character, and even if some

of the saprophytes do find their way into the circulation, the police of the organism as a rule promptly dispose of them, and the patient recovers even when a Cæsarian section has been made.

MICHIGAN'S CO-OPERATION WITH THE GOVERNMENT IN THE VENEREAL DISEASE PROBLEM.

VARNEY (*Journal of the Michigan State Medical Society*, March, 1919) notes that in 1912 Congress passed a law to the effect that any soldier who was unable to perform his duties on account of venereal disease should forfeit his pay during that period and be kept under strict quarantine. This law was the outcome of the loss of men from active duty through venereal diseases, which comprised about one-fourth of the total sickness. It readily will be seen from this that the United States Public Health Service had taken definite steps in the control of this sanitary problem long before this country entered the late war. It is an accepted fact that our nation has learned and profited much from the mistakes of the other warring nations. This is particularly true regarding the prevention, treatment, and control of venereal diseases in the army. In the first two years of war the French and British armies showed the usual high percentage of infection and invalided thousands of trained men to the large venereal disease hospitals of both countries. Furloughs were allowed, and spent in London and Paris, where the uniformed man was the prey of the taxicab driver and prostitute until his pay check was exhausted, when he returned to the ranks with a venereal infection which prevented his resuming active service.

The United States army and navy admit men with gonorrhea and syphilis to the cantonments for the reason that the soldier with venereal disease can be just as well, or better, treated in the service, while the strict quarantine prevents his spreading the infection, and after vigorous treatment he is further educated in prophylaxis and continence.

The military regulations for prevention, punishment, quarantine, and hospital treatment place the army and navy in a much higher health status than the civilian population. It has been a short time since the uniformed men of the army, and more especially the navy, represented, and were, our greatest carriers and transmitters of venereal diseases. The tattooed mark of the sailor was considered to be a manifestation of a venereal infection by some clinicians. To-day, under the new medical regulations, the United States uniform represents, and is recognized by the civilian population as representing, a sign of the healthiest, cleanest body of men that ever filled the ranks of any army. We know that infection acquired by the soldier in a foreign land by a strain from a foreign blood represents the most virulent type of the disease and results in infection of the innocent.

War measure hospitalization of the irresponsible, mentally deficient female venereal carrier has afforded an opportunity far in advance of any hospital care given this class hitherto. It is observed because we now have complete quarantine of the most dangerous of communicable offenders.

During the hospital care they carry on intensive primary treatment of one or both venereal infections; about 60 per cent having double infection. Appreciating the injustice, as well as the waste of valuable time and hospital expense, of forcing individuals to submit to treatment for syphilis when it did not exist and the greater injustice of failure to detect the disease when present, which has been the frequent mistake of all general hospitals in the past, the secretary of the State Board of Health and the heads of the hospital service have held several joint sessions to formulate a standard system of diagnosis and treatment. The result was a standard laboratory examination and clinical diagnosis, rechecked in every case to definitely exclude error, for the future of the syphilitic rests absolutely on the medical adviser.

The heads of the different departments are especially selected for the work and have at their call the special medical and surgical services of the hospital. The sur-

geon consults upon the removal of the pelvic appendages in extensive gonorrheal infection, it being impossible to cure some cases without this assistance. The dental department cares for pyorrheic gums before starting mercurial treatment, a necessary precaution to prevent disagreeable mouth conditions. The oculist is consulted daily, and there are always patients on the waiting list for tonsillectomies.

Every patient is also examined by a psychologist and classified. It is startling to note that 84 per cent of the patients are mentally deficient. In addition to this, a secretary of the Social Service Department takes a social history, which is most valuable in placing the patient in the right position and surroundings when she is discharged from the hospital.

While in the hospital the time of these patients (unless confined in bed) is scheduled for different work. Idleness or loafing is not encouraged. Every girl must go for her own meal tray; no one is allowed to bring it to her. Patients care for their beds, do their own laundry, work a certain time daily in the Red Cross work-room, receive instruction in physical culture and in vocational training. Through the interest of one of the hospital trustees, a branch machine shop has been added. During their training and treatment and till their discharge, they receive twenty-six cents per hour for work. The result is that they go out from this service with a bank account and a position awaiting them. Nor is the social life neglected. In the evening there are entertainments conducted under the auspices of the Young Women's Association. Their reading material is also carefully selected.

A numbered triplicate discharge certificate with a recommendation for further observation and treatment is filled out; one copy of which remains with the history, another being sent to the State Board of Health, and the last to the doctor in the social service zone in which the patient lives. Here the patient is placed under the care of the social service department of the hospital and State. She is furnished with clothing, placed in a home in a position to earn her livelihood, and requested to report periodically to the social service clinic. The mentally deficient are sent to institutions.

Many must continue treatment, and in order to prevent loss of time and oftentimes loss of position, a night clinic is now connected with this service.

THE HYPOPHYSIS AND HYPOPHYSEAL DISEASE.

SCHNOOR (*Journal of the Michigan State Medical Society*, March, 1919), after a brief but comprehensive summary of the experimental work bearing on this topic, notes that the treatment of pituitary lesions lies chiefly in the realm of surgery. Cushing has treated some cases with the glandular extract with notable improvement, especially in cases of hypopituitarism. Recently Cauvin reported a case of acromegaly due to a hypophysis neoplasm with marked visual disturbances treated with extract and the *x*-ray, with marked improvement in vision and relief of intracranial pressure phenomena, but no improvement in acromegalic findings and amenorrhea.

Indications for operative procedure differ somewhat with the surgeon.

Cushing and Hochenegg have operated in a few cases of active acromegaly with some beneficial result; but in Cushing's case improvement was only temporary.

Von Eiselsberg does not consider simple acromegalic or dystrophia adiposo-genitalis phenomena without increased intracranial pressure or visual disturbances as indications for operation, nor cases in which minor visual disturbances are stationary under frequent observation of an oculist, nor cases with irreparable ocular conditions and headache absent or mild, but yielding to narcotics. Hirsch agrees with Von Eiselsberg that acromegaly without visual disturbances is not a sufficient indication for operation; but further states that in every case with disturbed vision, no matter whether the growth be intracranial or intrasellar, operation is indicated.

Operations on the pituitary are extremely

difficult and dangerous, the gland being quite inaccessible, the possibility of infection great, especially if the transphenoidal route is employed, and brain trauma liable if the intracranial route is used.

There are two modes of approach to this small body, the intracranial route and the extracranial or transphenoidal route. The surgical procedure varies with conditions present, indicated by symptoms, signs, and *x*-ray findings.

The intracranial route is especially applicable for neoplasms which extend intracranially, a much better view of conditions being obtained than by the transphenoidal route.

Canton and Paul suggested the middle fossa approach, which was later employed by Horsley. Anterior fossa approach was first introduced by Krause, who resected the frontal bone and separated the dura to the lesser wing of the sphenoid, where it was incised and the hypophysis exposed. Kiliani opened the dura immediately after the frontal bone was resected. Anterior fossa approach has been further modified and put into use by McArthur. Incision is preferably made over right side from inner end of eyebrow to the outer aspect of the external angular process, cutting through all tissues to the bone, supraorbital vessels being ligated without including the nerve. Following the normal furrow a perpendicular incision is made from nasal end upward 3 to 4 cm., tissues and periosteum loosened from bone and reflected up, periosteum of orbital roof also loosened, orbital contents being displaced downwards. A portion of the frontal prominence from the frontal sinus to the external angular process and one-half of the orbital roof are removed, the bone being preserved in blood-warm saline, later to be replaced. The remaining part of the orbit to the optic foramen is removed, the dura is detached from bone covering the inferior surface of the frontal lobe, reaching the clinoid process and the free edge of the wing of sphenoid; the shelving off of the floor into the sella is determined, and the dura between the clinoid processes is incised 2 to 3 cm., thus exposing the optic nerve and chiasma and the pituitary body.

The transphenoidal route gives a better means of attack upon conditions growing into the sphenoid, but the danger of infection is great and the operative field is narrow.

Von Eiselsberg states that the entire hypophysis can hardly ever be completely removed.

Cushing's cases as a routine procedure received up to 60 grains of urotropin the day previous to the operation and for several days following.

Combined partial removal of the neoplasm and radiotherapy have shown some improvement in the cases in which Cushing has employed the same.

Cushing performs a sellar decompression operation in cases with persistent headaches and to encourage the extension of a glandular struma into the sphenoid cells rather than into the cranial cavity; partial removal of a hyperplastic gland in the active stage of hyperpituitarism; partial removal of the tumor for relief of neighborhood symptoms; subtemporal decompression for relief of intracranial pressure symptoms when an intracranial extension has occurred; subtemporal or sellar decompression or both for more favorable application of *x*-rays; and suggests the exposure of the brain or of some other organ in marked hypopituitarism, to implant a viable gland.

Von Eiselsberg has operated on sixteen cases—three males and thirteen females, ranging from eighteen to fifty-two years of age. Eight cases were of the Frohlich type, six acromegaly, and two a combination of both. He lost four cases, death being caused by meningitis in all cases. Beneficial results (?).

Hirsch has operated on twenty-six cases with three deaths, a mortality of 11.5 per cent. Kanavel's method has been employed in thirty-two cases with a mortality of 37 per cent. Schloffer's in forty-five cases with mortality of 37.8 per cent. Cushing has used the transphenoidal route twenty-nine times followed by four deaths, a mortality of 12.7 per cent.

Cushing states that the results of surgical intervention in most cases of hypophysis disease are only relief of neighborhood symptoms and palliation of increased intracranial pressure phenomena.

SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.

SHIVERS (*Colorado Medicine*, February, 1919) calls attention to the fact that cases of pulmonary tuberculosis now classed as operative are discards passed on as hopeless and not amenable to any other form of treatment.

Pneumothorax stands out to-day as the most valuable achievement in modern treatment of the tuberculous. The indications for pneumothorax are so clearly defined in recent literature that tabulation is unnecessary. The principle of organ rest was first conceived by Carson. Forlanini, Murphy and Brauer were the first to apply organ rest to pulmonary tuberculosis by means of pneumothorax. From the pneumothorax class it is an easy matter to determine the type of tuberculous patient that merits surgical intervention. Being a case in which pneumothorax is indicated, but cannot be given, classifies it as surgical.

What are the conditions that prevent pneumothorax in a patient entitled to lung collapse? There is one and only one, namely, fixation of the lung to the chest wall by adhesions. Surgery is not indicated in the acutely ill. The lung must have resisted the infection and shown positive signs of defense before operation is undertaken. Repeated efforts to collapse the lung by means of air or nitrogen without results is sufficient evidence of differentiation. Extrapleural lung collapse should never be undertaken where pneumothorax can be accomplished, and should not be attempted until pneumothorax has been thoroughly tried by a competent physician and failure is certain as proved by the roentgenologist. In a case in which pneumothorax is indicated and cannot be given, death is inevitable. Any method that offers hope to the hopeless is justifiable, even though the mortality is high and permanent cures are few.

If a surgical procedure is indicated in pulmonic tuberculous cavities, then it should be clearly a rational measure in old empyema and bronchiectasis. Any method that does not obliterate the cavity must fail.

The method as carried out by Sauerbrück consists in cutting the back ribs, from the first to eleventh. About two inches from the spine of the vertebra a line of anesthesia in the skin is established, begun with the first rib and carried well down to the twelfth. Subcutaneous anesthesia is maintained in the muscles of the back by deep injection. By directing the needle into the intercostal spaces, all the dorsal nerves are completely anesthetized both proximally and distally. Incision is made through the skin from the first to the eleventh rib down through the muscles, including the trapezius, rhomboideus major and rhomboideus minor. Part of the latissimus dorsi and the serratus, if it is heavy, are divided. An additional amount of anesthetic is injected into the intercostal spaces, both proximal and distal, during which time the assistants are caring for hemorrhage by ligation. The ribs are then resected. They are really lifted from the periosteum and pleura, leaving the wall intact. In some cases, particularly where the chest wall is contracted and the ribs are stacked one on the other, it is easier to resect each rib as soon as denuded of periosteum. Great care should be used not to puncture the pleura in the tuberculous cases, and in empyema to stay clear of fistulous openings. In the treatment of chronic empyema, drainage at the bottom of the bucket must be established, and if the opening in the pleura has been placed posteriorly in the primary operation, one must be made low in the axillary line and the posterior opening permitted to heal before radical measures are undertaken. Should the fistulous tracts be invaded, or the tuberculous lung or pleura gotten into, we may expect serious infection and a stormy time in a large number of cases. Even in the most careful resection the infected lung and pleura may jeopardize our

results, because of direct extension of infection from the diseased lung to the traumatized tissues overlying it in our field of operation. This danger is not nearly so great in empyema cases as in the tuberculous. Hemostasis completed, muscles are sutured with interrupted sutures, and skin in the same manner. A small perforated rubber tube is inserted under the muscles well up to the second rib and fixed in the lower angle of the wound. Anesthesia should be preceded by hyoscine and morphine one hour before the beginning of the operation. The position of the patient is best upright, with the head leaning on a support, arms crossed in front of the chest. After the incision is completed the patient may be turned on his well side and the operation continued in the recumbent position. The amount of rib resected should be generous, increasing from above down. Good results depend upon this. Rib resection completed, the tendons of the pectoralis major and minor are cut, the muscles packed well into the cavity, and the skin sutured.

Surgery does for the tuberculous what it does in any other surgical lesion, namely, places the patient in an attitude to get well. Success is attained only by persistency, repeated operation, and application of many methods. Primary mortality is close to twenty-five per cent.

HYPERTROPHIC STENOSIS OF THE PYLORUS IN INFANTS.

GREEN and SIDBURY (*Surgery, Gynecology and Obstetrics*, February, 1919) after an abstract of the well-recognized symptomatology and pathology of this affection report six cases, with excellent photographs of two of them taken some weeks after operation. Five of them were operated upon and recovered; as did the sixth, surgical intervention having been refused by the mother.

When this condition was first described, it was assigned to the surgeon for treatment. His results, however, were so discouraging that other methods were attempted; in some instances with flattering results, notably a series of cases treated by Hutchinson, with 20 per cent mortality. Many of the so-called medical cures were cases of pyloric spasm and not hypertrophy. Granting that they were hypertrophic, they were relieved of the spasm, which had supervened on the hypertrophy and produced obstruction, and allowed to go on with the hypertrophy, which is always prone to relapse. Since 1905, however, with the perfection of the technique of gastroenterostomy the surgical treatment of this condition has once again occupied the foreground. Scudder reports a series of 36 gastroenterostomies, covering his cases, Richter's and Stillman's, with a mortality of 13.8 per cent; while others show an improvement in their mortality percentages as time goes on. In 1913 Rammstedt described his operation of dividing the pyloric muscle fibers down to the mucous membrane, and partially separating the muscle ring from the mucous membrane, allowing the mucosa to bulge up into this wound. This the authors believe is going to be a distinct advantage in the treatment of this condition, and will serve materially to lower still further the mortality rate. While they cannot but admire the record that Scudder and Richter made with gastroenterostomy, the authors are of the opinion that gastroenterostomy is a far more serious operation than the Rammstedt procedure, and will sooner or later give way to the much simpler operation, which accomplishes the same result with less danger to the patient, and which permits of the giving of food and fluids so much sooner, establishing a more speedy convalescence. The Rammstedt operation is accomplished in from fifteen to twenty minutes from the beginning of the administration of the anesthetic until the child is taken from the table. In one of the authors' cases this was accomplished in ten minutes.

One must, of course, use care to avoid tearing through the mucous membrane. This can readily be done if the separation of the pyloric muscle, after its division, is begun at the stomach side, and we proceed gradually toward the duodenum. If, how-

ever, a small tear is made, it can readily be taken care of by clamping and ligating at this point with a fine silk thread as one would ligate a vessel. A stomach tube should always be passed after the abdomen is opened to allow the air, which the child has swallowed while taking the anesthetic, to escape from the stomach. As a matter of course each operation is preceded by a gastric lavage. After the operation on the pyloric muscle is completed, the stomach tube is inserted, and the stomach inflated with air to determine whether or not any perforation of the mucous membrane has occurred. In this way perforation can be demonstrated and taken care of when it might otherwise be overlooked. Feedings are started as soon as the child awakens from the anesthetic, which is usually in about two hours.

To Downes must be given the credit of demonstrating the efficiency of the Rammstedt operation. His results are most striking. The medical care of these cases after operation is just as important as a successful operation. Often bad judgment in feeding or in changing a feeding may cause a fatality where the operation has been thoroughly successful.

These cases must have breast milk; they must have it in small quantities at the beginning, and it must be increased slowly. In the authors' cases they followed the method adopted at the Babies' Hospital, New York. They start the feeding two hours after the anesthetic, or when the baby is well awake from the anesthetic, with four cubic centimeters of breast milk and four cubic centimeters of barley water every three hours, increasing four cubic centimeters of breast milk every other feeding until they get the breast milk up to thirty cubic centimeters, and then they give thirty cubic centimeters of breast milk every three hours during the day and every four hours at night. The baby is not allowed to nurse the mother from five to seven days after operation, and is weighed before and after nursing to determine the amount he gets. Castor oil is given twenty-four hours after operation. Practically every case treated has received an anteoperative hypodermoclysis. Some few received hypodermoclysis after the operation. The greatest care is taken not to chill the baby during operation, and external heat is applied for a number of hours after operation. Should a diarrhea follow the operation we would treat it the same as other diarrheas, with protein milk or protein and breast milk. These cases are feeding cases still, and some of them may remain difficult feeding cases, and when the surgeon has finished the operation the baby should be turned over to some one who has some skill in feeding infants. In these cases more than any other the coöperation of the surgeon and the pediatrician is required for success.

TREATMENT OF ACUTE GONORRHEA BY THE MASSAGE-PACK METHOD.

FIGARTY (*British Medical Journal*, March 1, 1919) states that the basis of the treatment consists in packing the anterior portion of the urethra with a material soaked in silver solution. The pack not only absorbs the discharge and drains the infected part, but by mechanically dilating the urethra it enhances the prospects of the chemical reaching the site of infection, and prevents apposition between infected and non-infected surfaces.

For packing soft gauze is far superior to cotton-wool. It is more absorbent, less irritating, and more easily passed into and withdrawn from the urethra; it has no tendency to break, and shreds are not detached from it.

In the large majority of the author's cases argyrol has been used for preference, but during periods of shortage silver vitelline has been tried with equally successful if not quite as speedy results.

From a curative point of view an argyrol solution stronger than 5 per cent is not necessary, and 7 per cent and 10 per cent show a tendency to cause soreness, necessitating less frequent packing, thus depriving the case of the benefit of the mechanical advantages of the pack. He has found hemorrhage even with 10 per cent a rare occur-

rence, and not in one single instance with 5 per cent.

The patient having passed water, and the glans penis and prepuce having been well washed with 1-in-8000 solution of potassium permanganate, a probe is introduced into the urethra to determine its general direction and whether there is any narrowing or other obstruction.

A strip of soft open woven gauze is cut half to three-quarters of an inch in width and about seven inches in length. The width of the strip should vary with the size of the meatus, and with experience and practice can be estimated accurately. Having rolled the strip into a cylinder and well soaked it in 5-per-cent argyrol, one end is folded over the extremity of a probe and passed up the urethra until resisted at the bend. Thus the whole anterior urethra will be packed. The excess of the pack may be cut off at the meatus.

The procedure is facilitated by opening the meatus with the tips of the thumb and index-finger of the hand holding the penis, and by balancing the free end of the strip on the little finger of the hand holding the probe. If the penis be slightly tilted upward and the strip well balanced the loss of argyrol by dripping will be obviated. There is no danger of injury to the urethra if a moderately large probe with a good bulbous extremity be used.

Having packed the anterior portion of the urethra, the penis is then gently massaged for five minutes, all the movements being made toward the root of the penis.

The pack is then withdrawn, the meatus, in so doing, being gently compressed between the finger and thumb in order to leave behind in the urethra as much argyrol as possible.

A second pack is then introduced in the same manner as the first and retained for four hours, or, if the patient does not require to pass water, even longer. Whilst the pack is being retained for four or more hours there is no tendency for the discharge to trickle outward along its side, and on withdrawal there is no evidence, such as a flow of pus, to suggest an accumulation of discharge behind the pack. On the other hand, on withdrawal the pack will have lost most of its argyrol color, and pus, especially in cases with copious discharge, may be easily squeezed from it.

The number of packs given in the day's treatment will be guided by the condition of the case, but as a general rule the pack is indicated with a purulent discharge or with acute subjective symptoms, such as scalding, even before the purulent stage is reached. The majority of cases have responded to two packs a day (morning and evening), but when necessary, as in a number of cases, three packs in one day may be applied.

The pack is rarely necessary after the fourth morning of treatment. As soon as the discharge, observed before passing water in the morning, ceases or becomes non-purulent (clear watery), the pack should be discontinued and treatment confined to gentle irrigation with 1-in-5000 potassium permanganate three times a day.

Between the dates March 1 and December 31, 1918, the writer has applied the treatment to 742 cases of acute gonorrhea. Of these the number "not cured" and evacuated to a venereal hospital on or before the eighth day of treatment according to orders was only 13, comprised as follows: Uncomplicated failure, 7; complicated (bubo 1, epididymitis 5), 6.

Up to early September—that is, with 498 cases—cure was determined by the absence of subjective symptoms combined with a dry urethra, or merely a clear watery secretion observed on massage and expression in the early morning before the patient had passed water.

Since that date the decision on physical signs as to cure of the remaining 244 cases has been supported by the microscope. Unfortunately, owing to the difficulty in obtaining counter-stain, only the smears relative to 184 of the cases were stained by Gram's method. Smears of all these 184 cases were taken before water was passed on the mornings after the first, the third,

and the fifth day of treatment, with the following results:

Number in which Gonococci were Found.

In smear taken on morning after the first day	148
In smear taken on morning after the third day	23
In smear taken on morning after the fifth day	1

(This case was considered a failure, and is included in the 7 uncomplicated failures mentioned above as having been evacuated to venereal hospital.)

Further, with this series of cases confirmed by the microscope, advantage was taken of an order to the effect that men cured of gonorrhea would be retained in the depot for an observation period of nine days after cure. All 183 cases were examined and smears taken on the third, the sixth, and the ninth days of this period, and in no single instance was a return of the physical signs observed or were gonococci found.

Apart from the encouraging results, only seven uncomplicated failures in 742 cases (183 out of 184 proved by at least four negative smears in each case), the method has in addition the following advantages:

1. The ease and simplicity with which it can be carried out.

2. It is comfortable and soothing to the patient, alleviating the sensation of wanting to pass water, and there is much less tendency to painful erections, which characterize the condition under irrigation methods.

3. It reduces irrigation and syringing during the acute purulent stage to a minimum, and thus lessens the risk of driving the infection into the posterior urethra or further.

4. It does away with the leakage of the discharge at the meatus, and thus obviates the possibility of troublesome balanitis. This condition did not occur once in the author's series of cases.

5. On withdrawal a definite pattern on the pack or the adherence of mucus or shreds will often indicate local areas of disease.

6. It has an economic advantage over other methods, much less silver solution being required.

REVIEWS.

THE OXFORD MEDICINE. Advance pages, Volume I, parts 1, 2 and 3, edited by Dr. Henry A. Christian and Sir James Mackenzie, M.D., F.R.S., F.R.C.P. Oxford University Press, New York, 1919.

In the three parts of Volume I of Oxford Medicine, so-called, we find articles devoted to what may be called, on the one hand, elementary medicine, and yet, on the other, advanced medicine. In other words, these sample articles deal with general themes. Barker writes upon the "Rationale of Prognosis and Diagnosis;" Cabot upon "Medical Social Service;" Henderson on "Physical Chemistry;" and James on "Environment—Its Effect on the Patient;" and so on.

In part 2 we find an article by Hewlett on "Pathological Physiology and its Relation to Internal Medicine," and a second one on "Hydro-Therapy" by Guy Hinsdale. All of these articles are of value and may be considered preliminary to the consideration of the individual diseases which later parts or volumes will take up.

We confess that we have turned with the greatest interest to the article by Sir William Osler entitled "The Treatment of Disease," because, notwithstanding the fact that he is one of the most eminent of living medical men, the treatment of disease is hardly the theme which we would have supposed would have been assigned to him. He is frank enough in his article to admit that he has been called "a thera-

peutic nihilist," and that it has been stated of him that his therapeutic armamentarium was nux vomica and hope. With our appetites whetted to see how he would deal with this theme we find that he has dealt with it charmingly, but along general lines rather than with specific statements. He shows his ecclesiastical ancestry in not infrequent quotations from Scripture, and quotes the ancient fathers in medicine with the familiarity that reveals his grasp of early medical literature.

Possibly what he has to say as to mental healing, ancient and modern, may well be quoted, because it not only reveals what he thinks but also reveals to some extent the tenor of the entire contribution:

"In all ages and in all climes the prayer of faith has saved a certain number of sick. The essentials are first a strong and hopeful belief in a dominant personality, who has varied naturally in different countries and in different ages: Buddha in India and in Japan, where there are cults to match every recent vagary; Aesculapius in ancient Greece and Rome; our Saviour and a host of saints in Christian communities; and lastly, an ordinary doctor has served the purpose of common humanity very well."

We fear that the deeply religious will be somewhat shocked at this combination in one sentence, but the objectors will agree with Dr. Osler's next statement that "Faith is the most precious asset in our stock-in-trade."

Concluding this paragraph Sir William recognizes the limitations of mental healing by pointing out that cures occur only in functional disorders, and that we know only too well that the prayer of faith neither sets a broken thigh nor checks an epidemic of typhoid fever.

The greatest value of Dr. Osler's article is that he attempts to impress, and succeeds in impressing, upon us the need of careful study of every therapeutic procedure, and that we should not be carried away by undue enthusiasm until a thing has been proved to be good.

He points out with clearness the advances made in the last fifty years and says that great as have been the triumphs in surgery, they are but skirmishes so to speak in comparison with the campaigns which medicine has waged against acute infections, saying that nothing has been seen like it on this old earth since the destroying angel stayed his hand at the threshing-floor of Araunah the Jebusite. He quotes Cuba, Panama and Porto Rico as three of the places where disease has been conquered, and thousands upon thousands of lives saved.

What he has to say in regard to the inevitable in medicine is also interesting. He quotes Sir Thomas Browne as saying that the "hardest stone that you can throw at a man is to tell him that he is at the end of his tether," and yet put in the right way to an intelligent man this is not always true. He then adds that we are to remember that we are teachers and not the servants of our patients, that we must do what is best for the relief of their sufferings, but that we must face the inevitable.

Sir William deals with manufacturing pharmacists, and in one paragraph on page 244 he uses these words: "We owe a deep debt to the modern manufacturing pharmacist, who has given us pleasant and potent medicines in the place of nauseous and weak mixtures; and such firms as Parke, Davis & Company of the United States and Burroughs & Wellcome of England have been pioneers in the science of pharmacology."

Osler then attacks those pharmaceutical concerns that attempt to teach the profession how it shall practice therapy and asks what right Z & Company have to send out on a card directions for the treatment of anemia and dyspepsia. He deplores the fact that members of the profession tolerate this.

Sir William points out that recrudescence of old ideas constantly occurs, and says that "once or twice in each century the serpent entwining the staff of Aesculapius gets restless, untwists, and in his gambols swallows his tail and at once in full circle come back upon us old thoughts and old practices." He then states that students should study

the action of the few great drugs, but immediately adds that he is "not going to give away his list," although in the same paragraph he speaks of digitalis, opium, and mercury.

The value of Sir William's article consists not in telling us how we shall deal with individual patients, but in providing food for thought and in impressing the physician with the idea that before he prescribes a drug he should, to use the words of the railroad sign-post, "Stop, look, and listen."

Another very interesting article in part 3 is by John J. Mackenzie on "The Living Causes of Disease and How They Act."

Then there is one upon "Eugenics in Relation to Medicine" by Davenport.

Part 3 concludes with an article by Dr. Frank Billings on "Focal Infection." Dr. Billings concludes his article with these words: "The intravenous injection of nonspecific proteins in the treatment of chronic infectious arthritis has produced remarkably beneficial results, as indicated by clinical reports made by many reliable physicians," but concerning the employment of autogenous vaccines and antisera in the treatment of chronic infectious arthritis, malignant endocarditis, gonococcus arthritis, and other focal infections, Billings expresses the belief that the therapeutic use of these agencies is not warranted by the results observed.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., assisted by L. F. Appleman, M.D. Volume II, June, 1919. Lea & Febiger, Philadelphia, 1919.

The June issue of Progressive Medicine contains as in previous years an excellent article on Hernia by Dr. William B. Coley, of New York, and another one upon the Surgery of the Abdomen, Exclusive of Hernia, by Dr. Abraham O. Wilensky of the same city. The article on Gynecology is by Dr. John G. Clark; that upon Disorders of Nutrition and Metabolism, Diseases of the Glands of Internal Secretion, and Diseases of the Blood and Spleen, by Dr. Elmer H. Funk, of Philadelphia; and the closing article upon Ophthalmology is contributed by Dr. William F. Hardy, of St. Louis.

It may be recalled that the object of Progressive Medicine is to review the literature of a given subject during the past twelve months, and to present to the reader information obtainable in such literature in a readable form, with criticisms on the part of the writer of the article of views with which he disagrees, or, instead of criticisms, he expresses his own opinions in confirmation of those which he has quoted.

DIET IN HEALTH AND DISEASE. By Julius Friedenwald and John Ruhräh; 5th edition. W. B. Saunders Company, Philadelphia, 1919. Price, $6.

The authors of this book are so well known as practical clinicians that we are not surprised to find that the fifth edition has followed the fourth within a very few years.

There are two types of books dealing with dietetics: One written from the purely scientific aspect, and the other from the aspect of the man who is working at the bedside and who wants to know the diets which are most suitable in various conditions of disease. Furthermore, the active practitioner wants a definite statement of symptoms which are diagnostic of dietetic errors, and, again, wishes suggestions as to the diet which should be instituted for the correction of the difficulty. The text of this volume provides just this material. Thus in the discussion of the feeding of infants we find a paragraph dealing with the disturbances which are due to too low protein and too high protein content; to too low and too high sugar, and to too low and too high fat content. In these paragraphs the symptoms presented by the patient are described, and so it is easy for the physician to determine what ought to be done.

As the volume covers more than 900 pages, it is by no means a small handbook,

and in some respects gives advice not only as to diet but to associated drug therapy.

Curiously enough, we find on page 516 that arteriosclerosis, from the dietetic standpoint, is considered in eleven lines, whereas aneurism is given almost a page, and high blood-pressure three-quarters of a page; general anemias are discussed in about two pages, but chlorosis takes up three.

We note with interest the statement under consideration of diet for leanness that it is much easier to reduce a patient who is obese than to fatten one who is thin, which we think is the universal clinical experience and is what would be expected. But what we are going to do in the near future to obtain brown stout, porter, ale, etc., which the authors advise for lean patients, is a question; although prohibition does not in any way contradict the correctness of the authors' advice.

Toward the end of the volume a very considerable number of pages are given over to diet tables and recipes for the preparation of foods for the sick. The book is an admirable one and thoroughly deserves to succeed.

ESSENTIALS OF SURGERY. By Archibald L. McDonald, M.D. Illustrated. J. B. Lippincott Company, Philadelphia and London, 1919.

This book, written for students, graduate nurses, and those interested in the sick, has the merit of covering the subject-matter lucidly and in such wise that one with a common-school education and a desire to learn can with this as a text acquire a knowledge that is likely to be serviceable in all conditions of life. There is assumed an elementary knowledge of anatomy, physiology, and bacteriology. This being absent in the lay reader will prove a bar to the thorough grasp of much that is so forcefully taught. There is no attempt made to discuss technical nursing methods. The book is warmly to be commended. At the end of each chapter under the head of demonstrations there are indicated methods of practical study.

CORRESPONDENCE.

THERAPEUTIC POINTS.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: A practitioner often stumbles onto something good, not known to many.

Over 90 per cent of women object to the taste of licorice, therefore their medicines should not contain it. In a record kept of fifty women who took a laxative powder containing licorice, forty-eight of them objected to the licorice.

For the relief of toothache, nothing equals acetanilide, a grain or two rubbed on the gums around the tooth. If a cavity is present put some into it; if an exposed nerve is present the pain may be intensified for a few seconds only, for in less than a minute the toothache has gone.

Vaginal suppositories containing much gelatin are objectionable; the gelatin melting and passing out dries on the external parts and is not easily washed off. For several years I have used a "00" capsule filled full with powdered boric acid, often with a little tincture of iodine, or iodine ointment, though an oily substance may not mix with a watery secretion. These capsules introduced at night are often passed the next day swollen, but not dissolved; but by making a few pin-holes in each end and side of the capsules before they are introduced they dissolve completely. They have been used in leucorrhea, at the last of menstruation, and from the second or third day after confinement, to prevent odor. No douches are given. Of nearly a hundred women who have used them, all speak in praise. Thymol iodide does not dissolve; it remains until washed out.

A. A. RADCLIFFE, M.D.

A CORRECTION.

In the June issue of the GAZETTE, on page 405, first column, a citrate of sodium solution 2 per cent is mentioned, although on the preceding page 0.2 per cent is stated, and elsewhere 0.24 per cent is named. The latter figures are correct. In other words, it should be 0.2 per cent or 0.24 per cent.